SUPRASEGMENTALS AND COMPREHENSIBILITY:

A COMPARATIVE STUDY IN ACCENT MODIFICATION

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A COMPARATIVE STUDY IN ACCENT MODIFICATION

I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirement for the degree of Doctor of Philosophy with a major in Communication Sciences and Disorders.

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DEDICATION

Mom and Dad

Tootsie

Sandy

Dr. E

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ABSTRACT

This study investigated the effectiveness of two methods of accent modification instruction. Thirty nonnative English speakers received an intonational-based instruction method for the pronunciation of American English. Half of those speakers received additional instruction and activities that were based on theories of cognitive processing of language. Three expert listeners evaluated pre- and post-instruction recordings of each speaker. Listeners were asked to rate the use of speech characteristics determined to be instrumental for intelligible speech on a 5-point Likert scale and three yes/no responses.

As a whole, the intonational-based instruction method resulted in significant increases in the use of positive speech characteristics. A modification of that method did not result in significant differences in any of the speech characteristics. Findings of this study support the focus on suprasegmentals in pronunciation training of English as a second language and may lead to more diverse methods and designs for accent modification research.

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LIST OF ABBREVIATIONS/NOMINCLATURE

ASHA	American Speech-Language-Hearing Association
CSD	Communication Sciences and Disorders
ESL	English as a Second Language
L1	Native Language
L2	Second (or Additional) Languages
SLP	Speech-Language Pathology/Pathologist
TESOL	Teachers of English to Speakers of Other Languages
VASTA	Voice and Speech Trainers Association

CHAPTER I

INTRODUCTION

Instruction which focuses on the oral communication aspects of English, either as a foreign language or the various dialects thereof, is provided predominantly by speech-language pathologists (SLPs), teachers of English to speakers of other languages (TESOLs), and accent/dialect coaches in the theater profession. Terminology varies between and within professional fields, from *accent modification*, *pronunciation teaching,* and *accent training*, respectively. There has been a proposed shift in perspective from a focus on accented speech to one of *communication enhancement*—one which moves towards *cross-cultural competence* (Cheng, 1999). This broader definition acknowledges the multitude of social, psychological, economic, and political implications that all accents and dialects entail.

The request for accent modification instruction reflects the struggle of bilingual and multilingual speakers in our monolingual society. Requests by nonnative English speakers for accent modification services have increased dramatically in recent years, partly fueled by U.S. companies' employment of more foreign-born workers (Toosi, 2003). As Toosi reported, "Many of them are highly educated and were taught English in their native countries, often in the British tradition…Some may consider their accent a barrier, not just to regular conversations, but also to climbing the corporate ladder" (¶ 9). Due to the diversity of service providers, however, data on the actual numbers of requests and services provided remain elusive.

As is typical for an emerging specialty, the increase in the number of providers has not been equaled by an increase in the amount of reliable research on accent modification. Each of the professional disciplines prefers its own terminology and methodology. In addition, within each one there is considerable fragmentation as to the most effective method. Without a unified standard, each is left to its own self-evaluation and verification of effectiveness. Surveys of TESOLs and SLPs (Brown, 1992; Fraser, 2000; Schmidt & Sullivan, 2003; Wolgemuth, 1994) have consistently reported (a) insufficient training in pronunciation instruction/accent modification in the TESOL and SLP curricula; (b) no generally accepted diagnostic or instruction protocols; (c) lack of scholarly research on the effectiveness of methods and materials; (d) need for collaboration between professional disciplines. This study contributes to research on the effectiveness of accent modification instruction methods.

Variables that could affect intelligibility of accented speech have been the focus of many research studies: degree of accentedness (Derwing & Munro, 1997; Munro & Derwing, 1995a), discourse markers (Flowerdew & Tauroza, 1995; Tyler, 1992; Williams, 1992), dialects (Eisenstein, 1986; Matsuura, Chiba & Fjuieda, 1999), familiarity (Gass & Varonis, 1984), noise (Munro, 1998), self-repairs (Shehadeh, 1999), and speaking rate (Munro & Derwing, 2001). Results indicate that it is possible for accented speech to have high levels of intelligibility and comprehensibility. The current conundrum is that there is no universally accepted way of assessing intelligibility. Researchers Derwing,Munro, and their colleagues have demonstrated the most progress in the systematic assessment of intelligibility of foreign-accented speech. They have consistently used a 9-point rating scale for the measurement of variables such as

intelligibility, comprehensibility, fluency, and accentedness. They also have produced the few studies that have questioned the role of cognitive processing time in comprehensibility (Munro & Derwing, 1995a, 1995b) and the effectiveness of instructional methods (Derwing, Munro, Wiebe, 1998; Derwing & Rossiter, 2003).

Conventional methods of accent modification focus solely on the production of speech, specifically segmental features such as training on consonants and vowels (Compton, 1983). Other methods incorporate suprasegmental features such as prosody as the key to significant improvements in intelligibility (Edwards & Strattman, 1994; Edwards, Strattman, Cuda & Anderson, 1990; Sikorski, 1988a, 1988b). Recent studies (Derwing, Munro & Wiebe, 1998; Derwing & Rossiter, 2003) have compared the two instructional approaches and strengthened the evidence that the suprasegmental instructional method results in the most improvement in comprehensibility, accentedness, and fluency (the term *fluency* represented the rate of speech and hesitations). Derwing and Rossiter (2003) attributed this finding to the automaticity involved in prosody training. They proposed that attentional resources are released for other language purposes, such as accessing semantic information, which results in more complex and fluent speech productions.

The purpose of this study was to investigate the effectiveness of an accent modification instructional method based on suprasegmental features, specifically, intonation. This study assessed the method detailed in Edwards and Strattman's (1996) *Accent Modification Manual*. An indication of a method's effectiveness is the perceived

change in speech characteristics associated with increased intelligibility (e.g., variety in pitch, placement of pitch, linking words together) and an overall perception of ease of intelligibility.

In addition, this study compared the traditional Edwards and Strattman procedure to a modified method. Modifications were made to the existing Edwards and Strattman method that reduced the amount of explicit instructions, increased the amount of implicit teaching strategies, and incorporated additional activities—all of which were aimed at facilitating language processing and creating a more communicative environment.

Results from this study will extend the knowledge base regarding effective accent modification instructional methods. The following questions were addressed: (a) Do students who receive the Edwards and Strattman method of accent modification demonstrate improvements in the use of positive speech characteristics? (b) Is there a difference in the use of positive speech characteristics between students who receive the Edwards and Strattman method (relying upon explicitly taught strategies) and the modified method (relying upon implicitly taught strategies)?

CHAPTER II

REVIEW OF LITERATURE

Research in second-language learning, specifically pronunciation, has been conducted in a variety of fields (e.g., teaching English as a second language, applied linguistics, linguistics, psychology, psycholinguistics, sociolinguistics, phonetics, phonology), yet has not been integrated and applied to classroom instruction. This study was inspired by recent research in second-language learning (Clement, Baker, & MacIntyre, 2003) that combined multiple preceding theories into a novel unitary construct. This study offers a model of accent modification instruction that coordinated research from a variety of sources. Two prominent themes emerged from the review of literature: cognitive processing is integral to pronunciation learning (Cook, 2001; Fraser, 2000; Paradis, 2002), and a communicative approach is the most effective method of instruction (Derwing, Munro, & Wiebe, 1998; Fraser, 1999; Morley, 1994; Shehadeh, 1999). This review of the literature will (a) define accent modification as an educational specialty, (b) briefly outline the history of this specialty and its influences on current theory, (c) present linguistic theories of multilingual speech production, (d) highlight cognitive processes that may facilitate and constrain second-language learning, (e) define the methods of accent modification examined in this study, and (f) culminate in the research questions addressed by this study.

Accentedness

Foremost, everyone speaks with an accent. As Morley (1996) expressed it, “Each of us has an accent, yet in our conventional wisdom, we often think it is others who have accents, who ‘talk funny,’ while *our* speech is the *right* speech—so of course, we are not

the ones with accents" (p.142). *Accents* in this sense is applied to any type of perceptible speech difference whether due to a regional *dialect* or the influence of a second language which results in a foreign *accent*. The focus of this research is *foreign accents*—regardless of native language or country. A widely held belief is that age imposes limitations on a person's ability to learn a foreign language and produce native-like pronunciation. Lenneberg's (1967) "critical period hypothesis" identified the age of 12 as the upper limit of language acquisition capacity. Krashen (1982) asserted that adults are still "acquirers" and "retain the natural language acquisition capacity children have" (p. 45). Krashen's hypothesis "allows for the possibility that some adults can achieve extremely high levels of competence in a second language and may even be taken for native" (p. 45).

Most everyone can identify a foreign accent when they hear one, even if they can not provide a linguistic explanation as to how it differs from their own speech. The American Speech-Language-Hearing Association has adopted Wolfram and Fasold's (1974) definitions of *accent*: "a phonetic trait from a person's original language (L1) that is carried over to a second language (L2)," and *dialect*: "sets of differences, wherever they may occur, that make one English speaker's speech different from another's." These phonetic traits include a combination of distinctive segmental (consonants and vowels) and suprasegmental (prosodic) features (duration, rhythm, stress, pitch, intonation, and loudness) that reflect the speaker's personal history (Langdon, 1999). Perception of the presence and strength of an accent are attributed to differences at the prosodic level. These temporal properties of speech are believed to play a major role in intelligibility (Anderson-Hsieh, Johanson, & Koehler, 1992; Derwing, Munro, & Wiebe, 1998;

Derwing & Rossiter, 2003; Kenworthy, 1987; Nelson, 1982; Tajima, Port, & Dalby, 1997; Tiffen, 1992). Although these definitions appear to be innocuous, they embody deeper, personal issues for many individuals. Many individuals who speak with a foreign accent seek out services variously called *accent modification*, *accent reduction*, or *pronunciation training*.

Accent Modification

Terminology

Terminology varies considerably among academic disciplines and professional fields who ultimately share the common goal of increasing communication skills of nonnative English speakers. Terminology also changes over time with the prevailing methodology and beliefs shared by the service providers.

A review of literature in the field of teaching English as a second language (TESOL) revealed an overwhelming preference for the term *pronunciation training*, or just simply, *pronunciation*. Voice coaches who work in the theater profession favor *accent training* or *dialect training*. The terms *accent modification* and *accent reduction* are relatively new to the second-language teaching environment. These terms reflect the perspective of the field of speech-language pathology, a newcomer to the English as a second-language domain. Throughout the review of literature, the terms *pronunciation training* and *accent modification* are interchangeable. For the purposes of the methodology of this study, the term *accent modification* is preferred. Consistent throughout the literature is the use of the abbreviations *L1* to indicated a person's native language and *L2* to indicate additional languages acquired.

Objectives

The objective of accent modification is not the elimination of accents. It is possible to speak English with a foreign accent and still be considered comprehensible. In fact, results of research have indicated that accent is not inextricably tied to intelligibility (Flege, Takagi, & Mann, 1995; Munro & Derwing, 1995a, 1995b; Munro, Flege, & MacKay, 1996). However, when the accent is so distracting on a variety of levels (e.g., pronunciation, prosody) that it detracts from the message and the listener loses interest in listening, then it is considered a detriment to communication. With the recent emphasis on the connection between prosodic features and intelligibility (Anderson-Hsieh, Johanson, & Koehler, 1992; Derwing, Munro, & Wiebe, 1998; Derwing & Rossiter, 2003; Kenworthy, 1987; Nelson, 1982; Tajima, Port, & Dalby, 1997; Tiffen, 1992), there has been momentum for a broader framework as the goal of accent modification—one that reaches beyond segmental speech skills and towards overall communication skills. These skills enhance every aspect of communication within and outside of the classroom. The broader view of *comprehensibility* or *communicative effectiveness* has surfaced as the ultimate goal of accent modification (Derwing & Munro, 1997; Gass & Varonis, 1984; Munro & Derwing, 1995a). This expanded view of second-language learning addresses the political and social realities (Cummins, 1999; Krashen, 1999; Morley, 1994) that nonnative speakers are faced with. It also places a responsibility on the part of the accent modification teacher for cross-cultural knowledge (Cheng, 1996).

Learners

The typical person who seeks out accent modification is a business professional over the age of 26 or a college student (Schmidt & Sullivan, 2003; Wolgemuth, 1994). They have a high level of English proficiency, yet their comprehensibility is hindered by a foreign accent. Typically, their motivation level is very high if they have sought professional advice on how to modify their accent. Each individual has their own motivations and reasons for pursuing training; it could quite simply be an issue of wanting to communicate more effectively. Unfortunately, motivation may stem from the fact that a foreign accent "may make a person vulnerable to stereotypical judgments, prejudices, and sometimes discrimination because some are deemed more acceptable than others" (Montgomery, 1999, p.81). These perceptions of foreign accents suggest that the difficulty of communication does not rest completely on the speaker—intelligibility can depend on the attitude of the listener as well as on the speaker's ability (Gass & Varonis, 1984).

Teachers

Accent modification instruction is provided predominantly by teachers of English to speakers of other languages (TESOLs), speech-language pathologists (SLPs), and voice coaches in the theater profession. At the present time there is no specific certification or regulation of the qualifications of specialists in accent modification. Each field has its individuals who have taken a special interest in pronunciation and pursued additional education and research. Unfortunately, these individuals' work rarely extends across disciplines nor involves collaborations with others outside their professions, although the future of accent modification may depend upon it.

Teachers of English to speakers of other languages. The traditional instructors of pronunciation, and still the majority, are teachers of English to speakers of other languages (TESOLs). Oral communication is just one component of the overall English as a second language (ESL) education field. In competition with other modes of communication that are easily quantifiable, such as reading and writing, pronunciation may lose its share of class time due to the complexity of assessment (Goodwin, Brinton & Celce-Murcia, 1994; Yule & MacDonald, 1994). Surveys of TESOLs (Brown, 1992; Fraser, 2000; Wolgemuth, 1994) indicated a desire for more training in how to teach pronunciation. Specifically, TESOLs cited: "lack of confidence and/or skill in teaching pronunciation" (Fraser, 2000, p.28); "[TESOL] people just don't know accent reduction" and a need was seen for "educating ESL teachers in speech" (Wolgemuth, p.71). Other obstacles to teaching pronunciation within the ESL classroom included (a) uncertainty in how to find time for it in the class time, or how to integrate it into other subjects; (b) what teaching methodologies and materials to use; and (c) what testing instruments and methods to use (Wolgemuth). Fraser's survey revealed that the methods TESOLs use to teach pronunciation vary widely: (a) drilling sounds/words/dialogues; (b) instruction in phonological rules; (c) listening; (d) no explicit instruction at all; (e) a mix of each of these. Fraser discovered that many of the teachers she interviewed "had little knowledge of cross-linguistic phonology or speech perception issues that are highly relevant to pronunciation teaching" (p. 29).

Speech-language pathologists. Accent modification services are within the scope of practice of speech-language pathologists (SLPs) as defined in the American Speech-Language-Hearing Association (ASHA) practice guidelines and policies. ASHA (2001)

stated that the practice of speech-language pathology involves "providing services to modify or enhance communication performance (e.g., accent modification, transgendered voice, care and improvement of the professional voice, personal/professional communication effectiveness)." Accent modification is included as an "elective modification of communication behavior and enhancement of communication" (p. I-29).

Although ASHA certifies SLPs qualifications to teach pronunciation, a survey of SLP graduate programs (Schmidt & Sullivan, 2003) indicated that there is a discernible lack of consensus about the most effective method for accent modification, including diagnostic and clinical goals. Schmidt and Sullivan concluded that this problem begins at the SLP training level where there is an under-representation in the curricula regarding how to serve the foreign-population. The results of their survey concurred with statements made in an article in *The ASHA Leader* (Stockman, Boult, & Robinson, 2004) that addressed the issue of multicultural education in the curricula. Although educational programs are required to include multicultural content in the curricula, there is variability in how it is implemented by academic and clinical programs.

Fraser (2000) noted the traditional focus of speech-language pathology has been on the physiology and articulation of speech sounds rather than the psycholinguistic perspective of second-language learning. The problems faced by second-language learners are much different than those having pronunciation difficulties in their native language. A participant in Fraser's survey emphasized the "differences between the knowledge needed for speech therapy and that needed for ESL pronunciation work, and is concerned that it is too easy for speech pathologists to be put in the position of 'ESL expert' without any real qualifications in language teaching" (p. 31).

Voice coaches. The profession of theater (and film) uses *voice and speech coaches* to prepare actors for roles requiring specific regional dialects or foreign accents. These coaches have received formal training in acting and are actors, or former actors, themselves. Most are members of the Voice and Speech Trainers Association (VASTA) and the majority have degrees in theater, forensics, communications, phonetics, and to a lesser extent, speech-language-pathology. VASTA's scope extends beyond theater to include vocal communication skills for all professional voice users and includes accent and dialect modification for nonnative speakers (VASTA, 2005). Although the educational backgrounds of individuals working as theater voice and speech coaches are diverse, they do not typically include specialization in English as a second language instruction, as do TESOLs, or in-depth training in phonology, phonetics, and articulation, as do SLPs. Voice coaches are more likely to incorporate holistic methods familiar to the theater profession such as the Alexander method (Alexander, 1932), the Lessac method (Lessac, 1967), or Feldenkrais movement training (Feldenkrais, 1972)—methods that use sensory awareness to help people focus on posture and movement habits that can be altered to facilitate breathing and speaking techniques.

Instruction Format

The delivery of accent modification services varies from individual instruction in clinical settings, to small groups, to large classrooms. ESL-related programs tend to utilize a classroom approach while SLP-related programs tend to offer more services to individuals (Wolgemuth, 1994). The number and length of instructional sessions depends upon the size of the class and the individual's English proficiency, motivation, time, and level of accentedness desired.

Historical Framework of Pronunciation Pedagogy

The history of pronunciation teaching reveals cycles of approaches that swing in and out of favor throughout the years. Current pedagogy incorporates the most efficacious aspects of various methods. A brief review of the major contributors to the field follows.

The earliest methods of pronunciation training were dominated by academic phoneticians in the late 1900s. The creators of the International Phonetic Alphabet (IPA) advocated extensive phonetic training for both teachers and learners. The preferred method of instruction was the *direct method*. In this method, learners listen-and-imitate as teachers produce models of the target (Celce-Murcia, Brinton, & Goodwin, 1996). In Shaw's (1916) *Pygmalion* (and the musical movie adaptation, *My Fair Lady*), phonetician Henry Higgins taught cockney-accented Eliza Doolittle to refine her speech using this method. Emphasis on the explicit instruction of phonetics extended into the 1940s and1950s. The *audiolinguism* (or *oral*) *approach* was the primary method for teaching articulation of individual sounds. Based on the direct method, the audiolinguism approach relies on drilling sound contrasts and word pairs, with very little attention to intonation or conversational speech.

From the late 1960s up to the early 1980s there was a decline in the amount of explicit pronunciation teaching (Morley, 1987). During this time the *intuitive-imitative approach* dominated the language learning scene in the form of listen-and-imitate audio language labs. This approach assumes the student will implicitly acquire foreign language

pronunciation without the intervention of any explicit information. An extreme version of this method is the *silent way* in which the teacher uses minimal spoken language and relies on visual aids to communicate.

The early 1980s saw a renewed interest in the explicit teaching of pronunciation in the form of the *analytic-linguistic approach*. Characteristics of this approach include direct explanations of articulation, the form and function of prosody, the phonetic alphabet, and practice in the form of minimal pair drills. The most significant shift in methods during this decade was the rise of the discoursed-based *communicative approach*. The communicative approach presents language through tasks that focus on meaning, using activities such as role playing, problem solving, and games (Celce-Murcia, 1987) in a relaxed, supportive classroom environment (Krashen & Terrell, 1983; Wong, 1987). In this approach, pronunciation is an integral part of communication, not a separate component. As a result, pronunciation does not make a significant impact on its own within this method because it is not explicitly taught. This method views pronunciation with a wider perspective than the established linguistic approach to phonetic inventories (Fairbanks, 1960) and acoustic phonetics (Cooper, Delattre, Liberman, Borst, & Gerstman, 1952; Lehiste, 1967). A shift in focus from segmentals to suprasegmentals (i.e., stress, rhythm, intonation, etc.) and from drill practice (explicit methods) to contextual, meaningful communication competence (implicit methods) took priority in the 1980s and set the precedent for the next decade (Morley, 1987).

By the 1990s, two major themes emerged in pronunciation instruction. Primarily, temporal properties (i.e., suprasegmentals, intonation) were widely recognized as the key to intelligibility (Derwing & Munro, 1997; Derwing, Munro & Wiebe, 1998; Edwards,

Strattman, Cuda, & Anderson, 1990; Munro & Derwing, 1995a). Additionally, the history of pronunciation instruction traces a shift in the type of communication in which the learners participate: from one-way (listening only), to restricted two-way (responding only), to full two-way (receiving and producing verbal messages) (Dulay, Burt, & Krashen, 1982). Although each has its place in different stages of language acquisition, in the 1990s there was an increased interest in the learners' attitudes, feelings, and involvement regarding second-language learning (Morley, 1994) and listeners' perceptions of foreign accents (Derwing & Munro, 1997; Flege & Fletcher, 1995; Flege, Munro & MacKay, 1995).

A definitive characteristic of the most recent research in pronunciation is the recognition of social and cognitive aspects of language learning and production rather than reliance upon the physical articulation (Derwing & Munro, 1997; Derwing & Rossiter, 2003; Munro & Derwing, 1995a; Pennington, 1994). Methods of second-language (L2) pronunciation teaching with the highest proven success rates have been suprasegmental-based, communicative approaches (Derwing, Munro, & Wiebe, 1998; Fraser, 1999; Morley, 1994; Shehadeh, 1999).

Traditional L2 research in learning and pedagogical applications has been rooted in the fields of teacher education (specifically TESOL), applied linguistics, and linguistics. The disciplines of psychology, psycholinguistics, sociolinguistics, anthropology, phonetics, and phonology have specializations in L2 research yet applicable research specifically in L2 pronunciation is scarce. The majority of all research in these fields has been done from a monolingual perspective. Research involving second languages has been limited to certain aspects of the L2, mainly reading

and the phonological aspects of speech production (De Bot, 1992; Dechert & Raupach, 1987; Faerch & Kasper, 1983). Very little research has been done in the area of second-language processing from a cognitive science perspective. Fraser (2000) expressed the need for expansion and creation of L2 research specific to pronunciation, "Pronunciation does not require simply applications of existing theoretical knowledge in a practical area. It requires theory development of its own" (p. 34). A theory of L2 pronunciation teaching/accent modification that emphasizes cognitive processing of language combined with the suprasegmental-based, communicative approach to language learning is needed in L2 research. These aspects are explored further in the successive discussions and culminate in a method of accent modification instruction that integrates this theory.

Bowerman (1985) observed that "different languages require speakers to attend to very different aspects of the world" and that "learning a particular language must involve learning to recruit cognitive abilities in particular ways" (p. 360). The question arises of whether there is one universal sense of cognition, or multiple cognitions relative to multiple languages. The answer may hold the key to the most efficacious approach to pronunciation instruction.

Language Production, Processing, and Acquisition

Speech vs. Language

Foremost, a distinction between *speech* and *language* must be drawn. As reviewed in the historical framework section, one can follow the focus of pronunciation instruction transition from *speech* as a "tangible, physical process resulting in the production of speech sounds" to *language* as "an intangible system of meanings and linguistic structures" (Slobin, 1971, p. 99).

Other definitions delineate speech and language along the lines of knowledge and action. Chomsky (1965) offered this prominent definition of these two concepts:

> Linguistic theory is concerned primarily with an ideal speaker-listener, in a completely homogeneous speech-communication, who know its (the speech community's) language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of this language in actual performance. (p. 3)

In this definition, Chomsky separates *knowledge* (i.e., *competence*), a mental capacity, from the production of actual utterances, *performance*. Since Chomsky's definition in 1965, the field of linguistics has expanded its view to accept multilingualism as the "norm" in the world and monolingualism as the minority (Cook, 2001; Wardhaugh, 2002). Conditions of "memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic)" are at the heart of research that takes a cognitive perspective of language processing and production (Bever & Sanz, 1997; Hahne, 2001). A comprehensive method of accent modification should take into consideration the complexities of multi-language production, processing, and ultimately, acquisition.

Multilingual Speech Production Models

Multilingual speech production models (De Bot, 1992; Grosjean, 2001; Green, 1998; Kroll & De Groot, 1997; Paradis, 1993; Roelofs, 1998) based on Levelt's (1989) monolingual model make a division between the activation of concepts (i.e., *conceptualization*) and the storage of concepts (i.e., *cognition*). The division may be

based partly on the belief that these aspects are located in different parts of the brain (Paradis, 2000). This information leads to the question of whether cognition is separate from language and if cognition varies from speakers of one language to another. Both are tied to the issue of linguistic relativity—to what extent is the way we see the world shaped by the language we speak (Cook, 2001)? Speakers of different languages have different concepts, however, concepts may or may not be language-specific (e.g., "going from English to Japanese means incorporating a social concept of respect" Cook, p. 4). According to Cook, multiple cognitions exist: "the L2 [second-language] user potentially has three types of element in the mind: universal elements, L1-specific [native-language] elements, and L2-specific elements, related in some complex way" (p. 4). Cook asserted that some contemporary models of L2 language production (De Bot, 1992; Green, 1998; Roelofs, 1998) do not take this possibility into consideration. Cook also proposed the view of multiple competencies based on the fact that L2 speakers possess varying levels of linguistic competence in each of the languages they speak. Success in speaking an L2 should not be measured by L1 monolingual competence, but instead acknowledge that there is no single final state of L2 competence.

Theories of Accented Speech

Second-language (L2) production models offer theories for errors in speech and the cause of foreign accented speech, these include *interference* (De Bot, 1992; Kroll & De Groot, 1997), *inhibition,* and *activation* (Paradis, 1993). Which model of language production you choose to endorse determines the explanation for errors made in the L2 and accentedness. De Bot's model is open to theories of *functional interference* from one language to another because of the shared processes. Other models of language

production propose independent modules (or subsystems of a larger linguistic system) for each language system, therefore eliminating interference but instead using activation or inhibition to select the language mode (Paradis, 2002). Functional interference is supported by the fact that bilingual speakers are often aware of their performance errors. The *monitor system* as described by Levelt's (1989) model allows the speaker to compare their production to their knowledge of the linguistic rules, which utilizes metalinguistic knowledge. This metalinguistic knowledge has been postulated as one means for choosing which language to activate.

Language Mode

The choice of language in which to speak is commonly known as *code switching*. Grosjean (2001) phrased it as *language mode* and described it as "the state of activation of the bilingual's languages and language processing mechanisms, at a given point in time" (p. 2). Grosjean described activation of the two languages as a continuum, ranging from no activation to total activation. Factors affecting where a speaker is positioned on the language mode continuum include (a) person(s) being spoken to, (b) the situation, (c) the form and content of the message being uttered or listened to, (d) the function of the language act, and (e) specific research factors.

The metalinguistic knowledge required for language mode is highly influenced by the contextual factors described by Grosjean (2001). Multilingual speakers are rarely equally proficient in more than one language. Language choice may be conscious or subconscious but it is dictated by social norms within context. Speakers are most proficient in the language they need the most, in the context they use it the most. "In a society in which more than one language (or variety) is used you must find out who uses

what, when, and for what purpose if you are to be socially competent. Your language choices are part of the social identity you claim for yourself" (Wardhaugh, 2002, p. 95).

L1 and L2 Acquisition

Knowledge of multiple languages raises the question of similarities or dissimilarities between L1 (native-language) and L2 (second-language) acquisition. Krashen (1987) made a distinction between language acquisition and language learning. According to Krashen, speaking in L1 is a product of the *acquisition* process—an *implicit*, unconscious process. Speaking in L2 is an outcome of *learning*—an *explicit*, conscious process. Studies based on amnesia and aphasia (Paradis, 2002) have helped identify which areas of the brain are involved in language learning, processing, and competence. The fact that some aphasic and Parkinson's disease patients retain access to a less proficient L2 (learned explicitly) and lose their L1 (learned implicitly) strengthens the argument that their implicit memory has been affected. Individuals with amnesia and Alzheimer's disease suffer impairment to their explicit memory and therefore have been observed to lose their L2 and retain their L1.

Paradis (2002) emphasized the role of neurolinguistics in L2 research when he interpreted the types of memories formed in the process of learning native and secondary languages. L1 learning relies upon procedural memory and L2 relies upon declarative memory. The format and age of acquisition are important factors of a speaker's proficiency. According to Paradis, "the more formal the learning method, the more the second language will rely on declarative memory; the more communicative the method, the more the second language will rely on procedural memory" (p. 5). Language learned incidentally will be "represented as automatically usable implicit competence (and the

more so, the younger the individual)" and language learned formally will be "represented as metalinguistic knowledge usable in a controlled manner (and the more so, the older the individual)" (p. 5). The formation of and access to separate types of memories in L1 and L2 languages highlights the underlying neuronal and physical differences in the cognitive processes involved in L1 and L2 learning. What constraints naturally exist in the process of language learning is the focus of the following section.

Facilitation and Constraints of Second-Language Learning

Language is a higher-level cognitive process due to its reliance upon learning and memory to integrate multiple processes. Therefore, language learning is facilitated and constrained by all the neurological and conceptual resources used to process information. According to Fraser (2000), "what is generally accepted among psycholinguists and phonologists who specialize in this area, is that the difficulty of learning to pronounce a foreign language is cognitive rather than physical, and that it has something to do with the way 'raw sound' is categorized or conceptualized in using speech" (p. 21). An effective approach to pronunciation instruction should confront the difficulty of reconceptualizing sounds in a new language (and culture) rather than just articulating them. The contemporary perspective of pronunciation instruction is based on a *cognitive* focus—one that investigates how the brain processes and learns new information with a focus on the learner as an individual—rather than a *linguistic* focus that centers on language. Complex factors of *learning* are (a) the encoding, storage, and retrieval of memories; (b) attention and capacity, (c) emotion, and (d) context. The effects of

emotions and capacity limits of memory have been indicated as key factors in language processing (Daneman, 1991; Ellis & Ashbrook, 1988; Engle, Cantor & Carullo, 1992; Engle, Conway, Tuholski & Shisler, 1995; Fortkamp, 1999; Krashen, 1987).

Memory

Two types of memory have previously been discussed: the role of declarative memory as a result of explicit instruction and procedural memory as a result of implicit instruction. Although each record different types of information they both are the result of a response to the environment. Understanding the structure of the environment allows a learner to form a mental representation, or cognitive map (Mowrer & Klein, 1989). Before an experience, a result of the environment, can be *encoded* into memory it must first be detected and *attended* to. The ease or difficulty of encoding and recalling memories depends upon a person's individual experiences, previous knowledge, and self-relevance of the information (Hunt & Ellis, 2004; Klein & Loftus, 1988). Anderson (2000) proposed that it is the depth of processing and encoding that affects what is recalled. It is *meaning*, rather than the surface form of the stimuli, that provides depth and improves the accuracy of the memory. Semantic and organizational-based encoding and recall rely upon previous knowledge to interpret a current situation. Additionally, Klein and Loftus suggested that the assessment of self-relevance increases both the relational and distinctive processes at encoding resulting in easier recall. Thus, information that is generated by an individual is better remembered than information that is seen or heard. The importance of meaningful events are evident in second-language (L2) learning theories such as Swain and Lapkin's (1995) comprehensible output theory. Swain and

Lapkin argued that output from the L2 learner was necessary to reach beyond the surface structure of language. According to their comprehensible output theory, when L2 learners are forced to find meaningful expression for their thoughts they are forced to reorganize their representations of language and concepts. Paradis (2002) emphasized that the intention and motivation to communicate are missing in most L2 school environments. Motivation may play an important role in the acquisition of a second language due to its positive influence on the underlying cerebral system responsible for linguistic competence.

Attention and Capacity

Engle, Conway, Tuholski, and Shisler (1995) supported the theory of *limited capacity* for attentional resources. If attentional resources are limited due to a diminished capacity or are in use for other processes, such as processing a second language, a lack of inhibition may result. An inability to inhibit irrelevant information, such as interference from L1 (native language) on the L2 (second language), may result in diminished language skills.

This theory has been applied to L2 instruction in recent studies (Derwing, Munro & Wiebe, 1998; Derwing & Rossiter, 2003) that compared instructional methods and strengthened the evidence that a suprasegmental instructional method results in the most improvement in comprehensibility, accentedness, and fluency (not proficiency, but rate of speech and hesitations). Derwing and Rossiter attributed this finding to the automaticity involved in prosody training. They proposed that attentional resources are released for other language purposes such as accessing semantic information which results in more complex and fluent speech productions. Their proposal is one of the few

to acknowledge and instigate the possibility of a limited capacity for language processing and its effects on speech production. It opens the gates to a deeper level of investigation of not only speech but of the mental functions as well as emotions and anxieties involved in speech production.

Emotion

Emotions have a significant impact on both the encoding and recall processes of memory. There are several theories of how emotions affect the memory process. The *resource allocation model*, otherwise known as the *capacity model*, was used by Ellis and Ashbrook (1988) as an explanation of the effects of emotional states on memory and cognition through the concepts of attention and cognitive interference. They contended that emotional states regulate the capacity allocated to a task. Emotions, especially disruptive negative or depressed emotions, can reduce the already limited cognitive resources needed for encoding and recall and produce intrusive, irrelevant thoughts which cause interference.

Eysenck's (1983) research indicated that anxiety can either help or hinder memory performance. He proposed a two-process theory attributed to worry and arousal. Anxiety tends to increase worry, which leads to an increase in distracting thoughts, which draw on attentional resources. Anxiety also increases arousal level, which interferes with recall. Individual differences account for a person's ability to overcome interference and distractions brought on by worry and arousal. Heightened arousal, to a limited extent, is helpful but too much is detrimental. Heightened anxiety and arousal may prime a person for *processing bias* geared toward threat-related information. The higher the anxiety level, the more quickly a person is to detect information perceived as being threatening.

One theory that took into account the role of emotions, especially negative emotions, in second-language instruction was the Affective Filter Theory. Krashen (1987) applied his Affective Filter theory to L2 (second-language) instruction by stating that the goal should be a teaching situation that lowers students' affective filters. "The effective language teacher is someone who can provide input and make it comprehensible in a low anxiety situation" (p. 32). The concept of a low-anxiety classroom as a key to facilitating L2 learning is widely supported (Fraser, 2000; Morley, 1987; Wong, 1987). Ideally, the creation of a positive environment for language use will lower anxiety and optimize cognitive resources available for learning. The focus on the *environment* of language learning emphasizes the contextual, social nature of language itself.

Context

Researchers should consider the social complexities of languages and accents as part of the research environment. Grosjean (2001) dismissed the vast majority of research in bilingualism because it has failed to take into account the importance of context upon a bilingual speaker's unconscious choice of language, which in turn affects all variables being investigated. What others have attributed to and labeled as interference, code-switching, shared representational/memory systems, and simultaneous language acquisition may all be the result of who the participants in the study are interacting with at the time. The context of the recordings and observations could itself be a confounding variable which induces language mixing. Language does not co-exist with a speaker, a speaker defines himself with language, and often it is the context which determines how a speaker defines himself.

The choice of language by a multilingual speaker is largely determined by the social context and situation. Wardaugh (2002) described a variety of factors: “location (city or country), formality, gender, status, intimacy, seriousness, and type of activity” (p. 98). While everyone makes these decisions to some degree, they are even more complex when the speaker is a multilingual speaker. Motivation becomes an influential factor because the choice of language, even degree of accentedness, becomes very revealing about the speaker’s personal background.. Through their choice of language, speakers may consciously or unconsciously decide what social information they want to convey about themselves in any given situation.

Contextual influences on the social and psychological aspects of the language learner were emphasized by Stevick (1978). He specified these as critical areas of language learning, especially regarding accent modification. Stevick warned that a nonnative speaker of English who changes his accent to a more standard pronunciation risks social inferences that others may draw about him. Excellent pronunciation may alienate him from his native-language speaking friends. Poor pronunciation may project an image of a poor student or incompetent worker. Nonnative speakers may become anxious about the sound of their own voice not representing their true self. Anxiety levels interfere with performance and create a downward spiral. Self-image and relationships with the target-language speakers place a limit on the extent to which a person is willing to accept a change in pronunciation. Stevick noted that these deeper, psychological, emotional, and social issues are missing from pronunciation training techniques focused on linguistics (e.g., Parish, 1977).

Communicative Approach

Cook (2001) asserted that contemporary models of second-language production should take into consideration the possibility of multiple cognitions and that different languages have different concepts which may or may not be language-specific. Some concepts may be tied to the culture the language represents. Consequently, it is impossible to learn a language without learning the culture. Although they share some cognitive processes, there are differences between how a first and subsequent languages are learned, processed, and produced (Paradis, 2002). Therefore, different methods of instruction are necessary for L2 (second-language) pronunciation than for L1 (native-language). Instructional methods conceived for monolinguals should not be applied to multilinguals and be expected to achieve the same results. Methods (e.g., Compton, 1983) that do not extend beyond speech sounds do not account for the inextricable cultural involvement in the cognition of language production.

Methods of L2 pronunciation teaching with the highest success rates have been communicative approaches that combine more than one aspect of pronunciation (e.g., both segmental and suprasegmental features) in an environment that supports a natural acquisition process (Derwing, Munro, & Wiebe, 1998; Fraser, 1999; Morley, 1994; Shehadeh, 1999). The crux of a communicative approach is that pronunciation should be explained as to how it affects the overall process of communication in real life contexts—contexts in which misunderstandings based on mispronunciations take place. Defining characteristics of this approach are (a) creating a supportive, anxiety-reducing classroom environment, (b) providing opportunity and motivation for meaningful communication,

(c) increasing learners' self-awareness of their own and others' speech production in order to facilitate self-correction, and (d) training the learners' to perceive multiple aspects of communication (i.e., gestures, body language).

Methods of Accent Modification

Edwards and Strattman Method

The method of accent modification applied by Edwards and Strattman (1996) was chosen as the foundation of this study primarily due to the authors' combined expertise in teaching English as a second language and speech-language pathology. Their research (Edwards & Strattman, 1994; Edwards, Strattman, Cuda, & Anderson, 1990; Teran & Edwards, 1979) and experiences in cross-cultural communication and education were applied to the classroom and published in the *Accent Modification Manual: Materials and Activities* (1996). This approach was based on investigations of pronunciation teaching methods across multiple disciplines which indicated that intonation should be the prime focus of training in accent modification.

The intonation method they used in a comparison study (Edwards, Strattman, Cuda, & Anderson, 1990) was developed by Stern (1987, 1995). It is Stern's method from which Edwards and Strattman borrowed the terminology of *jump up* and *step down* in pitch on appropriate syllables of words and appropriate words in sentences with a final *fall* at the ends of sentences. Subsequent studies (Edwards & Strattman,1994; Edwards, Strattman, & Anderson, 1991) identified intonation and linking of syllables as prosodic variables that received the most errors by nonnative English speakers, and indicated that sound substitutions and spelling pronunciations were the phonetic errors most likely to occur. Prosodic variables targeted in the Edwards and Strattman approach include (a) use

of intonation for stress, (b) use of average pitch to the point of pitch stress, (c) use of pitch jump for stress, (d) selection of word or syllable for the intonation jump, (e) step down in pitch, (f) intonational final fall in pitch, (g) pronunciation of the ends of words, (h) pausing, and (i) linking words together. A portion of each progressive section in their approach is devoted to phonetics in the form of sound processes (airflow, voicing, lip rounding) and the importance of reduced syllables on sound, stress, and rhythm; the majority of course content is suprasegmental features.

The Modified Method

The method of accent modification used in this study integrated cognitive and communicative aspects of language pedagogy. They are the driving forces behind the modifications made to the Edwards and Strattman (1996) method of accent modification. This researcher followed criteria Edwards and Strattman identified for developing an accent modification methodology: (a) based on current psycholinguistic theory, (b) supported by research, (c) produces positive change, (d) is teachable, and (e) is self-motivating. Based on these criteria, this researcher made revisions to the original method by taking into account the most current theories affecting second-language learning today: cognition, culture, memory, perception, capacity, self-image, and social contexts.

The instructional method used in this study followed the methodology described in Edwards and Strattman's *Accent Modification Manual* (1996) as closely as possible. All modifications were kept within the overriding belief that instruction focused on prosodic features results in greater improvements in speech than instruction focused on

segmental features. In subsequent discussion, the Edwards and Strattman method will be referred to as the "traditional" method and the method adapted for this study will be referred to as the "modified" method.

Reconceptualizing L2 teaching. The review of literature offered examples of language as a powerful mechanism that shapes the thought process, concept formation, and ultimately perception of self and society. Learning a new language involves more than speech sounds, it involves thinking in a new way. Kandel and Hawkins (1992) described learning and memory as central to a person's sense of self. A reciprocal relationship exists between learning experiences and personality: learning experiences with language help shape personality and vice versa, personality helps shape language learning experiences. Likewise, a reciprocal relationship exists between language learning and language instruction. The modified method of teaching pronunciation took this relationship into account with the immediate objective of increasing the capacity and resources available for language production and a holistic aspiration of a positive, self-motivating cycle of learning for the student.

Knowledge of a new language begins with *learning*, which in turn employs memory as the means of recording new experiences (Anderson, 2000). Formation of memories requires extracting information from the environment, which is all contextual within culture. How the overwhelming amount of information in the environment is filtered, organized, and associated to form mental representations depends upon what is perceived by the individual; perception is determined by what is attended to within the environment (Bruner, Goodnow, & Austin, 1956; Mowerer & Klein, 1989; Rescorla, 1988).

Individuals attend to incoming information that meets their expectations, preconceptions, and attitudes based on previous experiences within the environment (Kendler, 1987). These previous experiences provide meaning and self-relevance to the incoming information. Meaning facilitates the encoding of memories which are then organized by the type of information (e.g., implicit, explicit) and stored in different mechanisms (e.g., working memory, short-term memory, long-term memory) by different processes (e.g., chunking, rehearsal, associations) (Atkinson & Shiffrin, 1968; Baddeley, 2000; Baddeley & Hitch, 1974; Hunt & Ellis, 2004; Kendler, 1987; Miller, 1956). Recall of information is assisted by the depth of the meaning attached to, and the strength of associations between, stored pieces of information. The pieces (i.e., memories) are reconstructed to form a retrieved memory elaborated on by all the processes involved in storage and retrieval.

Second-language instruction can benefit from the learning process by incorporating the key components of attending, encoding, meaning, and retrieval. Teaching pronunciation begins at the teacher's awareness of the student's perception. The teacher's role is to direct the student's attention to aspects of speech that have always been present in his environment yet he did not "notice" (i.e., attend) because they were not meaningful to him. At this time, explicit means of instruction (e.g., teaching sound processes for phonemes) are necessary to create a framework the student can build upon as his skill increases (through the use of metalinguistic knowledge). Once the student can attend to and perceive the new information, it is necessary to help that information become meaningful to the student. The teacher's role is to create the opportunity for a variety and number of experiences the student finds personally relevant in order to attach

and strengthen meaning to the event and memory formed. At this time, implicit means of instruction (e.g., interaction with other students; observation assignments) encourage the development of the student's ability to monitor, diagnose, and make repairs to his own speech (through the use of procedural memory). Practice time is necessary for metalinguistic knowledge to be replaced by an increasing use of linguistic competence so that it is made more readily available (Paradis, 2002).

Facilitating language production. As previously mentioned, key factors in language processing are the effects of emotions and capacity limits of memory (Daneman, 1991; Ellis & Ashbrook, 1988; Engle, Cantor & Carullo, 1992; Engle, Conway, Tuholski & Shisler, 1995; Fortkamp, 1999; Krashen, 1987). Negative emotions or high anxiety can reduce the capacity necessary for encoding and recalling of information. One means of minimizing these negative effects is to create a positive classroom environment, one that reduces students' stress and anxiety. Another is to reduce the use of explicit instructional methods and the amount of metalinguistic demands upon the student. Instructional methods that focused on suprasegmental features were shown to have the greatest impact upon comprehensibility presumably because attentional resources were freed for other processing needs (Derwing & Rossiter, 2003).

A communicative learning environment that offers a variety of contexts in which to practice language prepares students for communication outside the classroom. Extending the language learning cycle into "real life" situations exposes students to new environments and increases the opportunities for meaningful exchanges. By directing students' attention to their own expectations of speaking-listening experiences, they are able to anticipate events and form predictions of the consequences (which may be

confirmed or disconfirmed). Prior to accent modification instruction, anticipation of communication breakdowns heightened anxiety and created a downward spiral. Prepared with knowledge and strategies of how to modify their communication in the event of breakdowns, students are able to create a positive communication experience which in turn lowers anxiety. Lowered anxiety frees the cognitive resources necessary to implement metalinguistic and procedural knowledge needed for successful speech which increases the possibility of positive speaking experiences which in turn, becomes motivation to seek more and varied experiences and creates an upward spiral of positive reinforcement. Communication experiences are powerful enough to create and reflect the personal and social constructs each person has built as their perspective of reality and self. To learn a new language, or modify how a person speaks, is to alter that reality.

A postmodern approach to psychology pioneered by Kelly (1955) called *constructivism* emphasized personal experiences and the environment; both of which are constantly changing and interpreted in varying ways (Neimeyer, 1999). In this view, there is no static core "self;" "self" is constantly revised and constructed. Knowledge of our reality is based on our perception, interpretation, assignment of meaning, and expectancy of events in our environment. In this way, humans "construct" their individual realities. From the constructivist philosophy, what we attend to is what we perceive, which in turn shapes our life story, and ultimately shapes how we define ourselves. Furthermore, language influences how we share, interpret, and express our life story. A nonnative speaker of English who changes his accent to a more standard pronunciation risks social inferences that others may draw about him. When assisting a speaker with a new way of speaking, the teacher is also affecting the way that speaker chooses to be

perceived by others. Consideration of a student's motivation for change as well as an appreciation of the challenges that change presents should be part of any accent modification program.

Statement of Purpose and Research Questions

The purpose of this study was (a) to investigate the effectiveness of the intonational method of accent modification instruction as exemplified by the Edwards and Strattman (1996) approach and (b) to investigate the influence of cognitive aspects of second-language learning and communicative-based teaching methods on accent modification through the use of a modified Edwards and Strattman approach. The following research questions were addressed: (1) Do students who receive the Edwards and Strattman method of accent modification demonstrate improvements in the use of positive speech characteristics? (2) Is there a difference in the use of positive speech characteristics between students who receive the traditional method (relying upon explicitly taught strategies) and the modified method (relying upon implicitly taught strategies)?

CHAPTER III

METHOD

The Edwards and Strattman (1996) approach to accent modification was based on research that provided evidence for the global, prosodic method of instruction as a successful factor in intelligibility (Edwards & Strattman, 1994; Edwards, Strattman, Cuda, & Anderson, 1990; Stern 1987). The first research question investigated the effectiveness of this method as it was applied to all 30 participants. In addition to the Edwards and Strattman methodology, the second part of this study modified the traditional method by replacing explicitly taught speech processes with implicitly taught speech strategies and incorporated additional assignments that focused on the language learners' experience of accent modification (Krashen, 1982; Parish, 1977; Stern, 1995; Stevick, 1978). The course structure was modified with the intention of reducing the load on memory in order to achieve greater results in communication effectiveness. In order to address the second research question, the participants were divided into two groups, control and experimental, and the results of the two teaching methods were compared.

Participants

Speakers

All participants in this study were nonnative speakers of English. Each participant was enrolled in an accent modification course (CSD 570) offered through the Communication Sciences and Disorders department at Wichita State University. The age of all participants ranged from 22 to 45 years with a mean age of

29.20 years of age. Every participant passed a hearing screening at 20dB HL from 500Hz to 4000Hz. None of the participants reported prior speech or language disorders in their native language.

Students enrolled in the course were not selected nor balanced by age, native language, English proficiency, or any other representational method. A criteria for participation in this study was an English proficiency level of at least "intermediate" status, one that indicated speakers were capable of using English as the primary mode of communication in an English-only environment. When applicable, participants provided a Test of English as a Foreign Language (TOEFL®, 2004) score. This test was taken prior to the study and although not a prerequisite for the class, it is an admissions requirement of Wichita State University for all undergraduate enrollments. A TOEFL score of 530 or higher on the paper-based test (197 on the computer-based test) is required in order to begin full-time undergraduate study. Responses to the following questions on the class questionnaire provided information regarding the speakers' English educational background and daily speaking opportunities: a) How many years have you studied English? b) How many years have you spoken English? c) How many hours a day do you speak your native language? d) How many hours a day do you speak English?

Experimental group. Participants in the experimental group were enrolled during Fall 2004 and Spring 2005 semesters. A total of 15 adult nonnative English speakers participated, 8 females and 7 males. All participants were bi- or multilingual speakers. The native countries and languages of the participants in the experimental group are listed in Table 1.

Table 1

Experimental Group Demographics

Participant	Language	Country	Gender	Age	Years Studied English	Years Spoken English	Hours English Spoken per Day	Hours Native Language Spoken per Day
1E	Chi[illegible]	T[illegible]	F	33	8	2	0	1
2E	Chinese	Taiwan	M	33	20	6	5	2
3E	Chinese	PR China	M	40	23	9	4	3
4E	Japanese	Japan	F	22	9	4	6	2
5E	Japanese	Japan	M	31	9	1	6	2
6E	Korean	S. Korea	F	45	6	3	2	8
7E	Spanish	El Salvador	F	24	13	6	8	8
8E	Spanish	Spain	F	31	22	17	8	2
9E	Spanish	Dominican Republic	M	27	9	7	10	2
10E	South Asian*	Sri Lanka	M	30	15	10	10	2
11E	South Asian*	India	F	25	18	24	12	2
12E	South Asian*	India	M	24	20	20	16	2
13E	South Asian*	Pakistan	F	22	12	1	6	2
14E	Vietnamese	Vietnam	M	30	10	9	.50	7
15E	Vietnamese	Vietnam	F	25	11	10	10	7
			M	29.5	13.67	8.60	7.50	3.47

*Three languages have been grouped into one category: South Asian. Tamil is within the Dravidian language family and Urdu and Sin Hala are members of the Indo-Aryan family (Swan & Smith, 2001). They all share distinctive features that create similar difficulties for nonnative speakers of American English.

Control group. Audiotapes were selected that represented students who had received accent modification instruction in previous semesters in the "traditional" accent modification method as defined by Edwards and Strattman. Fifteen tapes were selected from the archives to match experimental group speakers on the following characteristics: (a) language, (b) country, (c) gender, (d) English proficiency level as determined by responses to the class questionnaire. The native countries and languages of the participants in the control group are listed in Table 2.

Table 2

Control Group Demographics

Participant	Language	Country	Gender	Age	Years Studied English	Years Spoken English	Hours English Spoken per Day	Hours Native Language Spoken per Day
1C	Chi[illegible]	T[illegible]	f	25	10	2	2	10
2C	Chinese	Taiwan	m	33	10	3	2	10
3C	Chinese	PR China	m	38	22	7	2	1
4C	Japanese	Japan	f	29	4	4	8	2
5C	Japanese	Japan	m	22	8	1	2	2
6C	Korean	Korea	f	24	10	2	5	4
7C	Spanish	Colombia	f	27	1	.5	8	2
8C	Spanish	Colombia	f	27	5	5	6	2
9C	Spanish	Chile	m	21	6	4	6	0
10C	South Asian	Sri Lanka	m	32	25	12	10	0
11C	South Asian	India	f	27	18	18	8	2
12C	South Asian	India	m	26	20	10	1	2
13C	South Asian	Indonesia	f	28	4	2	4	12
14C	Vietnamese	Vietnam	m	34	13	10	1	6
15C	Vietnamese	Vietnam	f	27	5	5	2	18
			M	28.0	10.73	5.70	4.47	4.87

*These languages have been grouped into one category: South Asian. Tamil is within the Dravidian language family and Urdu and Sin Hala are members of the Indo-Aryan family (Swan & Smith, 2001). They all share distinctive features that create similar difficulties for nonnative speakers of American English.

Listener-Raters

The investigator and two expert listeners evaluated each speech sample. The investigator assisted Harold Edwards, PhD, and Paige Keithly, PhD, with the instruction of the Accent Modification class for four years prior to becoming the primary instructor. Kathy Strattman, PhD, co-authored the Accent Modification Manual and was co-instructor of the class for over ten years. Peggy Anderson, PhD, has extensive experience in the teaching and evaluation of English as a second language and the specific program of accent modification as described in the Edwards and Strattman manual.

Procedures

Edwards and Strattman Method

The Edwards and Strattman *Accent Modification Manual* (1996) is innovative in its focus on pronunciation training based on intonation patterns rather than articulatory drills. A small section within each chapter includes pronunciation advice for problem sounds in American English based on the processes involved (e.g., airflow, voicing, lip rounding). Class time devoted to practice of specific phoneme pronunciation exercises is minimal. The majority of class time is dedicated to the control of pitch "jumps" and "falls" from the word level to the sentence level. The Visi-Pitch (Kay Elemetrics, 1998) computer program presents a visual trace of pitch in real-time. This computer program aids students in developing their listening and speaking skills in identification of and control of pitch changes spoken English. The text incorporates individual and group exercises and requires integration of theory and practice to develop problem-solving abilities. The result is a set of skills that students can apply to any communication

context. The course, as it has been taught traditionally, followed the chapter sequence in the manual. There are 20 chapters but due to the time constraints of a 16-week semester, classes rarely covered more than the first 12 chapters. A typical semester's course is outlined in Table 3.

Table 3

Comparison of Traditional and Modified Accent Modification Course Structures

Traditional Accent Modification Course			*Modified Accent Modification Course*	
Week	Chapter(s) Page(s)	Topic	Chapter(s) Page(s)	Topic
1	p. xiv-xv, 247	assessments	p. xiv-xv, 247, 267-290	assessments
2	p. 253, 267-290	assessments	Chps. 1, 2	definitions, basic principles
3	Chps. 1, 2	definitions, basic principles	Chp. 3	pitch
4	Chp. 3	pitch	p. 164, 177, 179	unstressed & silent syllables; spelling
5	Chp. 4	pitch, use of dictionary	Chps. 4, 5	pitch control, relevant words
6	Chp. 5	pitch control	Chp. 10	ligatures & blends; continuous voicing; casual speech & slang
7	p. 253, 267-290	assessments	Chps. 6, 8, 12	pitch jump probability; special emphasis
8	Chp. 6	common phrases	Chps. 7, 11, 18, 19	all question intonation; prediction of pitch jumps; class discussion
9	Chp. 7	"wh-" questions	p. 104	show & tell presentation; class discussion; voice mails
10	semester break		semester break	
11	Chp. 8	pitch jump probability; show & tell	N/A	class conversations; body language; gestures
12	Chp. 9	practice *Fox & Grapes* w/pitch jumps	N/A	class conversations; practice gestures with presentation
13	Chp. 10	ligatures & blends	N/A	practice
14	Chp. 11	yes/no questions	N/A	practice
15	Chp. 12	special emphasis; *Blondie* presentations	N/A	practice
16	p. 253, 267-290	assessments	p. 253, 267-290	assessments

Modified Method

The instructional method used in the Accent Modification class for this study followed the methodology described in the *Accent Modification Manual* by Edwards and Strattman (1996) as closely as possible. All modifications were kept within the overriding belief that instruction focused on prosodic features results in greater improvements in speech than instruction focused on segmental features. Modifications made to the traditional method were intended to reduce metalinguistic demands while retaining the effectiveness of the traditional method and increasing generalizability to communication contexts outside the classroom.

Additions to the Edwards and Strattman Accent Modification Manual incorporated assignments based on real-life experiences. These included additional classroom presentations, voice mail assignments, written observations, interaction with native English speakers outside the classroom, and class discussions. Changes to the course syllabus are summarized in Table 3.

Preliminary. Prior to any classroom instruction, permission for recordings was obtained from each speaker-participant from the Student Questionnaire (Appendix A). This questionnaire is a standard part of the curriculum for the Accent Modification course in the Communication Sciences and Disorders department at Wichita State University. An additional consent form (Appendix B) was signed by all speaker-participants which permitted use of measures beyond those in the traditional curriculum. These included video taping of presentations, audio taped interviews with the instructor, and written assignments. Each participant was offered a copy of the consent form.

Modifications to manual. Based on personal experience teaching the course, the researcher incorporated student feedback into the course structure. The most frequent suggestion from students enrolled in previous Accent Modification classes was the need for more practice within the semester course or an additional course, an Accent Modification II, that focused purely on practice of the strategies learned in part one. In order to follow the Edwards and Strattman methodology and not exclude any important underlying theories and strategies, the researcher reorganized the sequence of the material covered in the *Accent Modification Manual*. Some strategies in the manual were replaced with new ones, with the intent that they would reduce the load on memory yet maintain effective results in communicative speech. The new strategies decreased the time dedicated to exercises in the manual and created additional time in the semester for practice.

The most significant change to the method was the use of *continuous voicing* to replace Chapter 10, "Using Ligatures and Blends." This chapter explains the specific effects of co-articulation between words by teaching the terms and speech characteristics of *ligatures* (consonant + vowel), *blends* (vowel + vowel), *H-deletions* (the loss of /h/ in pronouns when it follows a consonant, "soon ~~he~~"), and *voicing*. The traditional method of instruction requires students to identify the occurrence of ligatures, blends, H-deletions, and voicing in sentences in the workbook. Instead of learning these individual rules and practicing written exercises in the manual, students in the experimental group were taught how to distinguish and produce *voiced* and *voiceless* sounds. Without teaching the term *continuous voicing*, students were instructed on how to use the continuous voicing technique, a strategy borrowed from fluency treatment. Students were instructed not to

take pauses between words and to “keep their tongue in constant motion” as they spoke short phrases. They were instructed to focus on the feel of the movement of the articulators as the boundaries between words became indistinct. The objective of this technique is the production of ligatures, blends, and H-deletions without the need to recall the specific rules involved, with the desired result being increased memory capacity for other speech needs. Phrases from the cards used in the game Mad Gab®, casual speech, and slang expressions were used to demonstrate this point (e.g., “what’s up” = /wə'sʌp/).

Although Chapter 8, “Determining Where to Jump in Pitch,” was included in the modified method, the emphasize of pitch jump placement was placed on the underlying meaning of the sentence. The students’ attention was directed to which parts of speech have a higher probability of receiving pitch jumps and how that coincides with pitch jumps used for special emphasis. Students were told not to focus on words they do not understand clearly in native English speakers’ speech—as these words typically are not heavily loaded with meaning. Students were instructed to concentrate on the words they understood most clearly—as these words typically are the most meaningful and provide the most information in the sentence. The objective of this strategy was to reduce the time spent on interpretation of every spoken word in order to provide more response time for the nonnative English listener.

Additions to manual. A new classroom activity was added to demonstrate the identification of pitch jumps in conversational English. A video-taped portion of an episode of *Friends* (television series) was used to demonstrate which words are most likely to receive pitch jump. The researcher transcribed a 22-line dialog between the

characters Joey and Mackenzie. First, students read the transcript and made predictions of which words would receive higher pitch jumps, based on probability due to word class and the influence of context on special emphasis. They were instructed to underline the words on the transcript they believed would be higher in pitch. Next, students watched and listened to the video segment uninterrupted. Then, the video was watched again, with the instructor pausing the tape after every line in order for students to compare their predictions with the actual pitch jumps made by the actors.

To increase speaking opportunities in the classroom, two prepared speeches were presented by each student. The first one was the Show and Tell presentation, as traditionally included in the curriculum (p. 104). After this first presentation, a lecture was devoted to the use of body language, specifically facial and hand gestures while speaking and listening. The same segment of the videotaped episode of *Friends* that was used to demonstrate prediction of pitch jumps was played again to demonstrate movement and gestures. For the second class presentation, students were expected to incorporate body movement, eye contact, and hand gestures into their speeches. Presentations were videotaped and the instructor met with each student individually to review their videotape and comment on their use of intonation and gestures.

Three voice mail assignments were included in the course. Students were given a handout with a short message they were to leave on the instructor's office voice mail. Students determined where they would jump and fall in pitch. The topics were (a) "please return my call," (b) "I will be late to class, and (c) "replying to a classified ad about a car for sale."

Homework assignments required students to reflect upon language use—how they learned English, what they observed about the use of English, and how information presented in class applied to native speakers of American English. Some assignments required participants to observe American speakers and report back to the class if those speakers actually followed the strategies taught regarding intonation patterns, pronunciation, and gestures. Some assignments required participants to apply the rules learned in class to conversational speech by engaging in conversation with native English speakers outside of the classroom, in everyday situations.

Two group discussions were conducted in response to the homework assignments. The first discussion took place in the first half of the semester and focused on what the participants felt was the most helpful information presented in the course to date, and how it has affected their speech and their life. The next discussion took place in the second half of the semester. This discussion focused on the observation and interaction assignments that the participants completed over the semester breaks.

The researcher conducted individual exit interviews with each student based on seven questions (see Appendix C). These questions were designed to assess what the student deemed the most salient feature(s) of the accent modification course and their suggestions for future course modifications.

Data Collection

All data were obtained during a regularly scheduled, 16-week semester course—Communication Sciences and Disorders 570: Accent Modification. The audio recordings standard to the course curricula were obtained as pre- and post-instruction assessments. These recordings are part of the curricula as provided in Edwards and Strattman's (1996)

Accent Modification Manual (p. 267-290). Participants read: (a) 14 sentences designed to assess sound processes (form 2b), (b) two short paragraphs from *The Fox and The Grapes* (form 1a) and *The Lion and The Mouse* (form 4a), and (c) used spontaneous speech to create a story based on a sequence of pictures (form 3a). During the recording process, the participants were recorded one at a time, seated in a sound-treated room, and asked to read the typed passages presented before them. Participants had a maximum of 3 minutes to review all materials and practice. Participants were asked to read the four different reading tasks one after the other without taking long breaks between them. Participants spoke into a microphone (EltraVoice model 676 dynamic cardiod), and recordings were made through a Shure (FP32) mixer onto a JVC (TD-R462) cassette recorder. The researcher was not in the sound-treated room with the participant but was seated outside the room and visible through a window. When not recording, participants were seated in a classroom taking a multiple choice grammar test (standard in the course curricula) and were not allowed to discuss the recordings with the other students.

Preparation of the Evaluation Material

From each speaker's original cassette recording, a short selection from the fable, "The Fox and the Grapes" was saved as an MPEG audio file in Microsoft Windows Media Player at 22kHz with 56k-bit resolution. The speech sample consisted of 37 words:

> Again and again he tried. Still he could not reach the luscious prize. Soon he became very tired. Worn out by his efforts, he left the vineyard. "Well," he muttered, "I never really wanted those grapes anyway."

Two speech samples from each speaker were used, one selection from the pre-instruction recording and the same selection from the post-instruction recording. Four samples were added from archived student recordings to provide practice with the rating procedure. A total of 64 speech samples were used for this study: (a) 30 speech samples from 15 students in the experimental group (b) 30 speech samples from 15 archived student tapes (control group), and (c) 4 practice speech samples. Four practice samples were placed at the beginning of the CD. The remaining 60 speech samples were each assigned a number and the sequence on the CD was determined from a table of random numbers. The CD was played to the listener-raters in a quiet, free-field environment.

Rating the Speech Samples

Three expert listeners identified the use of eight variables: (a) use of pitch jump; (b) use of loudness instead of pitch; (c) use of appropriate syllable(s)/word(s) for pitch jump; (d) falls in pitch at ends of phrases; (e) links words together (e.g., a word-final consonant will migrate to the following vowel so that "I like it" will be "I-li-kit" and a vowel will blend to a following vowel so that "the shoe is" becomes "the-shu-wiz;" (f) uses appropriate duration of vowels; (g) uses additional speech characteristics (e.g., mispronunciations, rate, pauses); and (h) overall perception of comprehensibility. Variables a, c, d, e, and h were judged by the expert listeners on a five-point scale: 1 (*no control*), 2 (*little control*), 3 (*some control*), 4 (*good control*), 5 (*complete control*). Variables b, f, and g were judged as dichotomous categories: (*no control/complete control* or *yes/no*).

In order to determine if a Likert scale was adequate to represent the listeners' perceptions of the eight variables targeted by the speech samples, practice speech samples were used in a comparison between the qualitative assessment form (Form 1C) used in the manual and the holistic assessment ranked on a five-point scale by the expert listeners. The comparison of assessment measures for variable a (*use of pitch jump*) indicated that the use of the 5-point scale may more adequately reflect the listeners' perception of native-like speech than the quantitative measurements. Form 1C has a set number of pitch jumps that are counted as "correct" within the read passage. In a blind comparison, speech samples that contained twice as many pitch jumps as the form expected were also ranked a 3 (*some control*) or 4 (*good control*) on the Likert scale. Speech samples that were ranked a 1 (*no control*) or 2 (*little control*) were those that contained one half as many or three times as many pitch jumps as the assessment form expected—an extreme few or many. This indicated that the listeners' accepted a range of "correct" pitch jumps within the read passage, and extremes outside of that range were deemed nonnative-like. These results satisfied the expert listeners' prerequisite of a reliable scale ranking system that corresponded with a qualitative assessment. The most distinct advantage of the five-point Likert scale was its efficiency.

A rating rubric (Appendix D) was developed to reflect the consensus opinion of precisely what was being evaluated by the five-point scale for each of the eight variables. This rubric was developed based on the expert listeners' professional experience with rubrics used in English as a Second Language and Speech-Language Pathology assessments. Decisions were based on the intent that this rubric could have applications in future research involving accented speech and would be clear to listeners/raters who

may not have specialized training in accent modification. A brief description of each variable on the rubric follows. Variable a (*uses pitch jump*) addressed the issue of the speaker's use of pitch in their speech. It was decided that the inclusion of the words "uses pitch jump for stress" implied some knowledge of the speaker's *intention* of their use of pitch to indicate stress—something impossible for listeners to have knowledge of. The listeners worked from the premise that a limited variety of pitch octaves and/or a limited range is perceived as nonnative-like. It is possible to have a broad range with limited variety (e.g., extreme highs/lows with few transitional pitch levels). It is possible to have a broad variety with limited range (e.g., many small transitional pitch levels but within a narrow range of highs and lows).

Variable b (*uses loudness instead of pitch*) reflected the occurrence of loudness being used as a replacement for pitch. This required a dichotomous rating. A rating of 1 indicated no control (loudness replaced pitch, speaker did not have control over the use of loudness). A rating of 2 indicated complete control (loudness did not replace pitch, speaker had control over the use of loudness).

Variable c (*uses appropriate syllable(s)/word(s) for pitch jump*) combined the predetermined pitch jump placement as defined in the Edwards and Strattman (1996) manual with the judgment of the listeners' as to which syllables and words were deemed native-like choices for pitch jumps. The two extremes in rankings ranged from not choosing appropriate syllable(s)/word(s) to always choosing the appropriate syllable(s)/word(s).

Variable d (*falls in pitch at ends of phrases*) considered the consistency of pitch falls. Rankings of 1, 3, and 5 were easily established as either absent, inconsistent, or always present. The ranking of 2 was defined as only a "slight variation in pitch from a base-line" due to the number of speakers who made some audible attempts to change their pitch at the ends of phrases, but it was such a slight transition that it was hard to determine if it was under the speaker's control.

Variable e (*links words together (ligatures and blends)*) was deemed to have little association between the actual number counted on the Edwards/Strattman evaluation (Form 1C) and the subjective perception ranking. The focus of ligatures and blends was directed towards the perceptible outcome of linking and blending words together (a lack of linking resulted in choppy sounding speech and control of linking resulted in smooth sounding speech) instead of the actual identification of a consonant sound blending with a vowel sound (very difficult to do in real-time listening/evaluation).

Variable f (*uses inappropriate duration of vowels*) presented a challenge to evaluate since actual duration of vowels is nearly impossible to judge perceptually. The focus of this variable was directed towards the perceptible outcome of lengthened and reduced vowels: a native-like American English rhythm. This was made into a dichotomous rating of 1 (no control of duration resulted in nonnative-like rhythm which interferes with intelligibility) and 2 (complete control of duration resulted in native-like rhythm which does not interfere with intelligibility).

Variable h (*overall perception of comprehensibility*) was based on two main criteria: (1) ease of listening for the raters and (2) how distracting from the message the accent of the speaker was. Together these two criteria helped listeners reach an overall score that might confirm or contradict the speaker's ratings on the other variables. The listeners noted that it was possible for a speaker to do everything technically correct and receive high rankings yet still have an accent that was distracting and made it more difficult for the listener to comprehend.

Variable g (*uses additional speech characteristics (mispronunciations, rate, inappropriate pauses)*) provided an opportunity to note the presence of some undetermined distracting speech characteristics that weren't covered in the other variables. Some speakers who received high scores on all the variables still had "lingering issues" that interfered with variable h (*overall perception of comprehensibility*) resulting in a lower score for variable h than variables a-f might have predicted. The unpredictability of this variable excluded it from the rubric.

Four speech samples that were not part of either the control or experimental group served as calibration for the rating system. It was predetermined that the maximum number of times each sample could be heard was six. The speech sample was first listened to in its entirety, then each sentence was repeated. The three listener-raters listened to the recordings together and each provided a rating for each variable. After each sample they shared their scores and if there was a discrepancy among ratings a consensus was reached before proceeding to the next speech sample.

This procedure provided reliability of ratings for each speech sample. This procedure was followed for each of the 60 randomized speech samples from the randomized control and experimental group samples.

A mean score for each speech sample was derived from the ratings on each of the six variables. These mean scores provided a measure and direction of change in pre- and post-recordings for both methods of accent modification instruction (traditional and modified). The rating form used may be found in Appendix E. The final rating for each sample may be found in Appendix F.

Data Analysis

Ratings on the listeners' forms were compiled by the investigator. Data were entered into the Statistical Package for the Social Sciences 11.0 (SPSS) software program. Scores were provided from the listeners' ratings for speech samples within each of the four categories (traditional method—pre- and post instruction; modified method—pre- and post instruction). For the first research question, to determine if the Edwards and Strattman method had an effect on the use of positive speech characteristics, a dependent t-test analyzed differences in pre- and post-test scores on variable h (*overall perception of comprehensibility*) for all 30 speakers.

In order to address the second research question, a quasi-experimental design was used to rule out as many extraneous variables as possible (e.g., native language, amount of English education) and to ensure that differences between groups were due to the differences between the instructional methods. This type of design is typical for

experiments examining differences in language instruction (Derwing & Munro, 1997; Derwing, Munro, & Weibe, 1998; Derwing & Rossiter, 2003; Munro & Derwing, 2001; Eisenstein, 1986; Munro, 1998).

An analysis of covariance (ANCOVA) was chosen to analyze differences in the use of positive speech characteristics between students who received the traditional method and the modified method on variables a, c, d, e, and h. The ANCOVA statistically adjusted the scores of the speech samples due to chance differences among participants as well as between groups. The purpose of the ANCOVA is to reduce the error term commonly present in experiments that involve treatment and increase the sensitivity to treatment effects. A control variable is used to statistically account for pre-existing conditions that may interfere with treatment effects. In this study, the control variables were the speech sample pretest scores and the speakers' demographic information. These were chosen because the information was independent of the type of accent modification method the participants and groups received. The chi square analysis was used on variables b, f, and g due to these variables' use of yes/no responses instead of a ranking of 1 to 5.

CHAPTER IV

RESULTS

The present study was undertaken to determine the effectiveness of the intonational approach to accent modification as (a) exemplified by Edwards and Strattman (1996) and (b) as modified by this researcher. A total of 30 nonnative English speakers from accent modification courses (Fall 1992 to Spring 2005) which used the Accent Modification Manual (Edwards & Strattman, 1996) were included in this study. Pre- and post-recordings administered as a standard part of the course were used to assess the students' speech characteristics: (a) uses pitch jump; (b) uses loudness instead of pitch; (c) uses appropriate syllable(s)/word(s) for pitch jump; (d) falls in pitch at ends of phrases; (e) links words together; (f) uses appropriate duration of vowels; (g) uses additional speech characteristics (e.g., mispronunciations, rate, pauses); and (h) listeners' overall perception of comprehensibility. Variables a, c, d, e, and h were judged by the expert listeners on a five-point scale: 1 (*no control*), 2 (*little control*), 3 (*some control*), 4 (*good control*), 5 (*complete control*). Variables b, f, and g were judged on a dichotomous category: (*no control/complete control* or *yes/no*). Specifically, this study addressed the following research questions:

1. Do students who receive the Edwards and Strattman method of accent modification demonstrate improvements in the use of positive speech characteristics?

2. Is there a difference in the use of positive speech characteristics between students who receive the Edwards and Strattman method (relying upon explicitly taught strategies) and the modified method (relying upon implicitly taught strategies)?

Question 1: Edwards and Strattman Method

In the first research question, results indicated pre to post improvement, as a significant difference was found between the pretest mean 2.83 (*SD* = 1.23) and the posttest mean 3.43 (*SD* = 1.33) on variable h (*Overall Perception of Comprehensibility*). A dependent means *t* test was calculated to compare the pretest scores to the posttest scores of all 30 speakers on variable h. Results were significant at the specified .01 level, $F(1, 29) = 3.39$, $p < .01$.

A correlational analysis was conducted to determine the relationship between variables a, c, d, and e and the Comprehensibility posttest score. High correlations were found between the Comprehensibility score and variable c (*Uses Pitch Jump on Appropriate Syllable(s)/Word(s)*), and variable e (*Links Words Together*). Correlations in the range 0.7 to 0.9 are often described as large, strong, or high (Cramer, 1998, p. 141). Results are summarized in Table 4.

Table 4

Intercorrelations Between Posttest Speech Variables (N = 30)

Variable	1	2	3	4	5
1. (h) Comprehensibility	—	.77	.85	.79	.89
2. (a) Pitch Jump		—	.74	.72	.80
3. (c) Syllable(s)/Word(s)			—	.68	.82
4. (d) Falls				—	.63
5. (e) Links					—

To determine which variable accounted for the most variance on the posttest Comprehensibility scores, a stepwise multiple regression analysis was conducted. In this analysis, variable e (*Links Words Together*) accounted for 80% of the variance. The remaining variables did not account for additional variance of overall comprehensibility scores. Results are presented in Table 5.

Table 5

Stepwise Multiple Regression Analysis Between the Criterion Variable h (Overall Perception of Comprehensibility) and Four Speech Characteristics Variables (N = 30)

Variable	R^2	R^2 Change	F	p	df
Perception of Overall Comprehensibility					
(a) Pitch Jump	.60	.60	41.65	.00*	1, 28
(c) Syllable(s)/Word(s)	.73	.73	74.92	.00*	1, 28
(d) Falls	.63	.63	47.73	.00*	1, 28
(e) Links	.80	.80	109.84	.00*	1, 28

*$p < .01$

Percentages were calculated to compare the pre- and posttest change in binary ratings for variables b, f, and g. All variables resulted in positive improvement, representing complete control of each speech characteristic. The control of loudness increased 17%; the control of appropriate duration of vowels increased 23%; and the control of additional speech characteristics (detrimental to comprehensibility) increased 36%. Results are summarized in Table 6.

Table 6

Comparison of Binary Variables.

	N = 30		
Evaluation items	% (count) complete control in pretest	% (count) complete control in posttest	% (count) demonstrating improvements
(b) Loudness	73% (22)	90% (27)	63% (5 out of 8)
(f) Duration of Vowels	60% (18)	83% (25)	58% (7 out of 12)
(g) Additional Speech Characteristics	17% (5)	47% (14)	36% (9 out of 25)

Question 2: Modified Method

The second research question compared the effects of two instructional methods: (a) students who received the Edwards and Strattman method (relying upon explicitly taught strategies) and (b) the modified method (relying upon implicitly taught strategies). The experimental group was comprised of 15 students who received the modified Edwards and Strattman method and were matched by 15 students in the control group who received the traditional Edwards and Strattman method.

Descriptive statistics for the control and experimental groups are presented in Table 7. In order to determine if there was a significant difference between the two groups, four independent sample *t* tests were conducted for the speakers' English educational background and daily speaking opportunities. The following data were obtained from an in-class questionnaire: (a) How many years have you studied English? (b) How many years have you spoken English? (c) How many hours a day do you speak your native language? (d) How many hours a day do you speak English? Of the four language-related demographic variables, the control and experimental groups were significantly different at $\alpha = 0.05$ only in number of hours English was spoken per day. The experimental group spoke English significantly more often than the control group, $F(1,26) = 2.36$, $p < .05$ (the variances of each variable between control and experimental groups were assumed unequal so the degrees of freedom differed).

Table 7

Descriptive Statistics of Language-Related Demographics

	Control Group (n = 15)		Experimental Group (n = 15)	
Variable	M	SD	M	SD
Studied English (years)	10.73	7.35	13.67	5.59
Spoken English (years)	.70	4.88	.60	6.92
Native Language per day (hours)	4.87	5.28	3.47	2.56
English per day (hours)	4.47	3.02	7.50	3.95

Once a difference between groups was determined, an analysis of covariance (ANCOVA) was used to detect differences on dependent variables. ANCOVA is the

preferable analysis for pretest-posttest scores (Bonate, 2000). ANCOVA combines regression and analysis of variance to provide a precise result due to its account for regression towards the mean. It is frequently used in research (e.g., psychology, education, anthropology) that includes variables which cannot be controlled directly. This source of variance is represented by a control variable—a *covariate*. To determine what might have an influence on the posttest scores, five ANCOVAs were conducted using the pretest scores of each (Likert-ranked) variable and the four language demographic variables as covariates. Pretest scores were identified as the covariate variable, significant at $\alpha = 0.05$ (Table 8).

Table 8

Analyses of Covariance for the Influence of Pretest Scores and Language-Related Demographic Variables on Posttest Scores.

Variable	*SS*	*df*	*MS*	*F*	*p*	R^2 Adjusted
(a) Pitch Jumps	11.21	1, 29	10.98	11.47	.00*	.37
(c) Syllable(s)/Word(s)	12.01	1, 29	9.31	12.00	.00*	.43
(d) Falls	10.05	1, 29	13.50	13.43	.00*	.28
(e) Links	21.60	1, 29	11.57	12.89	.00*	.49
(h) Comprehensibility	26.43	1, 29	24.88	35.63	.00*	.61

*$p < .01$

Using the pretest scores as a covariate, posttest scores were adjusted by the ANCOVA for analyses of speech characteristics. Five analyses of covariance were conducted to determine the effect of group on the posttest scores of variables a, c, d, e, and h, covarying out the effects of pretest scores. The control group showed significantly better performances at $\alpha = 0.05$ in all speech evaluation variables. Results are presented in Table 9.

Table 9

Analyses of Covariance for the Influence of Pretest Scores on Posttest Scores.

	Control Group			Experimental Group			
Variables	Pretest score M (SD)	Posttest score M (SD)	Adj. posttest score M* (SD)	Pretest score M (SD)	Posttest score M (SD)	Adj. posttest score M* (SD)	*p*
(a) Pitch Jumps	3.1 (1.2)	3.7 (1.0)	3.7 (0.9)	3.1 (1.3)	2.7 (1.2)	2.7 (0.9)	.01**
(c) Syllable(s) /Word(s)	2.7 (1.0)	3.9 (0.9)	4.0 (0.7)	2.9 (1.1)	2.9 (1.2)	2.9 (0.7)	.00**
(d) Falls	3.0 (1.0)	4.2 (1.0)	4.3 (1.0)	3.3 (1.3)	3.6 (1.3)	3.5 (1.0)	.05*
(e) Links	2.3 (1.2)	3.3 (1.3)	3.3 (0.8)	2.3 (1.1)	2.3 (1.2)	2.3 (0.8)	.01**
(h) Comprehensibility	2.7 (1.2)	3.8 (1.3)	3.9 (0.6)	3.0 (1.3)	3.1 (1.3)	2.9 (0.6)	.00**

Note. Posttest scores were adjusted by corresponding pretest scores.
* $p < .05$
** $p < .01$

In order to evaluate the binary variables b, f, and g, a Pearson chi square was calculated comparing the control and experimental groups. Of the speech variables, the control and experimental groups were significantly different at $\alpha = 0.05$ only in posttest scores of b (*Use of Loudness*). The control group showed better improvement in b, f, and g. Results are presented in Table 10.

Table 10

Descriptives of the Control and Experimental Groups on Binary Variables.

	Control group		Experimental group	
Evaluation items	% (count) complete control in pretest	% (count) complete control in posttest	% (count) complete control in pretest	% (count) complete control in posttest
(b) Loudness	60% (9)	100% (15)	86% (13)	80% (12)
(f) Duration of Vowels	60% (9)	93% (14)	60% (9)	73% (11)
(g) Additional Speech Characteristics	13% (2)	60% (9)	20% (3)	33% (5)

Table 11

Chi Square Analysis

	Homogeneity test	
Evaluation items	Pretest scores	Posttest scores
(b) Loudness	$\chi^2(1) = 2.824$, $p = 0.09$	$\chi^2(1) = 4.493$, $p = 0.03$*
(f) Duration of Vowels	$\chi^2(1) = 0.000$, $p = 1.00$	$\chi^2(1) = 2.288$, $p = 0.13$
(g) Additional Speech Characteristics	$\chi^2(1) = 0.241$, $p = 0.62$	$\chi^2(1) = 2.1470$, $p = 0.14$

*p< .05

CHAPTER V

DISCUSSION

The purpose of this study was to examine the effectiveness of a method of accent modification based on intonation as (a) exemplified by Edwards and Strattman (1996) and (b) as modified by this researcher. This study builds upon and contributes to research regarding teaching pronunciation to nonnative speakers of English. Although a variety of methods are currently in practice (Compton, 1983; Dato, 1986; Gilbert, 2001; Morley, 1994; Sikorski, 1988a; Stern, 1987) there is little empirical evidence to suggest which method is most beneficial to nonnative speakers. The Edwards and Strattman method is based on research (Edwards & Strattman, 1994; Edwards, Strattman, Cuda, & Anderson, 1990), which indicates that instruction on prosodic features such as rhythm, intonation, and stress makes the most significant impact on overall comprehensibility and generalizability. At the heart of this study was the question of whether students who received the Edwards and Strattman method of accent modification demonstrated improvements in the use of positive speech characteristics (features that contribute to comprehensibility, e.g., variations in pitch). In addition, modifications were made to the Edwards and Strattman method which broadened the scope of the manual to incorporate cognitive processing of language within a communicative environment. The modified method integrated implicit teaching strategies with explicit teaching strategies, thereby creating time in the course schedule for additional activities that focused on the cognitive processing aspect. This study compared the use of positive speech characteristics used by students who received the traditional Edwards and Strattman method and those students who received the modified method. A summary and discussion of the results follow.

Summary

This study examined the use of positive speech characteristics before and after a course in accent modification as defined by Edwards and Strattman's *Accent Modification Manual* (1996). The speech characteristics targeted for instruction and evaluated for this study included (a) use of pitch jump; (b) use of loudness instead of pitch; (c) use of appropriate syllable(s)/word(s) for pitch jump; (d) falls in pitch at ends of phrases; (e) linking of words together; (f) use of appropriate duration of vowels; (g) use of additional speech characteristics (e.g., mispronunciations, rate, pauses); and (h) listeners' overall perception of comprehensibility. Thirty nonnative English speakers read a 37-word passage which was judged on a 5-point Likert rating scale (variables a, c, d, e, and h) or a binary ranking (variables b, f, and g) by 3 listeners who were trained in speech-language pathology and experienced in teaching English as a second language. All of the speakers received the Edwards and Strattman instructional method of accent modification in a 16-week university course. Half of the speakers (15 students) received additional assignments and instructions that comprised the modified version of the Edwards and Strattman manual.

Results of this study showed that all students who received the Edwards and Strattman method of accent modification made improvements in each of the targeted speech characteristics. All but one of the speech characteristics (variable a) showed significant increases from pretest to posttest scores. The use of pitch jump on appropriate syllable(s) and/or word(s) (variable c) and the use of links between words (variable e) were determined to have the strongest correlation to the perception of overall comprehensibility (variable h). Results showed that students who received the traditional

Edwards and Strattman method made significantly greater improvements in all speech characteristics than those students who received the modified instructional method. In the following sections these results will be examined with respect to factors that potentially influenced the outcomes and the implications for accent modification instructional methods and research.

Question 1: Edwards and Strattman Method

The first question in this study was whether the sample as a whole showed improvement in positive speech characteristics as a result of the Edwards and Strattman method of accent modification. The results indicate improvement in all speech characteristics and support the theory that an intonational instructional method results in improvement in overall comprehensibility. These findings support studies by Derwing, Munro, and Wiebe (1998) and Derwing and Rossiter (2003) and evoke questions of instruction and assessment techniques. The current study corroborates previous studies performed by Edwards and Strattman (1994, 1995, 1997; Edwards, Strattman, & Anderson, 1991; Edwards, Strattman, & Burda, 1998; Edwards, Strattman, Cuda, & Anderson, 1990) which investigated the role of specific prosodic variables.

Assessment

The results of this study appear to be even more convincing when method of assessment is considered. The current study used a short audio sample from a written passage that each participant read in its entirety in pre- and posttest recordings. The reading task was chosen to reduce the challenges that spontaneous speech presents in the judging process in terms of identifying and classifying errors. Whereas the majority of studies investigating the effectiveness of instructional methods rate broad dimensions of

speech such as *comprehensibility*, *accentedness*, and *fluency* (e.g., Derwing, Munro, & Wiebe, 1998; Derwing & Rossiter, 2003), this study examined very specific prosodic aspects of speech production (i.e., linking words together, jumping in pitch on the appropriate syllable) therefore the samples needed to be balanced for opportunities to use the prosodic variable strategies taught. Even when held to these stringent criteria, improvements were significant.

Instruction

The current study did not isolate intonation as the sole method of instruction, although it was the primary focus. Based on previous studies by Edwards, Strattman, Cuda, and Anderson (1990) and Edwards and Strattman (1994) it is expected that training on intonation will result in improved pronunciation, therefore intonation should be the primary focus of training in accent modification. A portion of every lesson in the Edwards and Strattman manual incorporates sound processes (airflow, voicing, lip rounding) and emphasizes the pronunciation of reduced syllables (i.e., use of *schwa*). Derwing, Munro, and Wiebe (1998) found segmental instruction the most successful form of instruction for reading tasks; therefore, this combination of instruction on segmental and suprasegmental features might have contributed to the success of the reading task in the current study.

Although the assessment tasks of reading and spontaneous speech were deemed equivalent for the purpose of analyzing prosody (Edwards & Strattman, 1995), the lack of spontaneous speech samples from this study may restrict comparison to other studies for analysis of other speech characteristics or broader dimensions of communication. The spontaneous speech samples used in the aforesaid studies were contextually dependent

upon a series of pictures. A drawback of that type of task is its lack of naturalistic conditions in which spontaneous speech occurs but an advantage is that it may be more reflective of carryover from the classroom to speech production than is a reading task. In a study comparing a trained reading passage, an untrained reading passage, and sequenced pictures, Edwards and Strattman (1997) identified the spontaneous speech task (sequenced pictures) as the weakest in terms of carryover of principles and strategies taught in a 16-week accent modification course. This result indicates that spontaneous speech is the most difficult speaking situation to apply strategies taught in the classroom and, therefore, is a rigorous assessment of carryover.

A limitation of the current study is its lack of evidence in favor of generalizability to spontaneous speech. As suggested by Edwards and Strattman (1997) in their study, it may be impractical to expect that a 16-week course will provide the skills necessary for complete carryover in spontaneous speech. When given time to prepare, either a speech or a selected reading, students perform better on prosodic variables taught in class. The researchers concluded that a greater time frame, perhaps of one year, and greater opportunities for spontaneous speech practice would facilitate generalization of principles and strategies taught in class to spontaneous speech.

A further limitation of this study lies within the experimental design in that no control group was included with which to compare the effects of the treatment. This limitation restricts the conclusions that can be drawn from the results of this study, allowing only the conclusion that this treatment method produced positive outcomes. Consequently, the results of this study cannot speak to the /relative/ effectiveness of this

treatment compared to other accent modification approaches or even no treatment at all. Future research should include one or more control groups who received alternate accent modification treatments and/or no treatment at all.

Prosodic Variables

Previous studies by Edwards and Strattman (1994, 1995, 1997), Edwards, Strattman, and Anderson (1991), and Edwards, Strattman, and Burda (1998) identified the prosodic variables of *linking* and *pitch control* as receiving the highest percentage of errors in speech by nonnative English speakers. The researchers repeatedly identified linking and pitch control as the most difficult principles to master and transfer to speech. The improvements in these specific speech characteristics made by the participants in the current study provide support for the Edwards and Strattman method of accent modification instruction.

Linking. Edwards, Strattman, and Anderson (1991) compared the effects of two instructional methods upon linking: (a) a prosody-based method, and (b) a pronunciation-based method. The prosodic group made significant positive changes on linking whereas the pronunciation group did not. The speakers in the current study made significant improvements in their use of linking words together. The importance of linking is further seen in its strong correlation to overall comprehensibility and the degree to which it accounts for the variability of comprehensibility scores.

Pitch control. Results of the current study showed a significant improvement in the use of pitch jump on appropriate syllables and/or words (variable c) but not in the more general use of pitch jump (variable a). The definitive difference between these two variables is *control*. As explained in the Methods chapter, the use of a variety of pitch

octaves and broad range is generally perceived by listeners as more native-like in American English. For variable a, the rating rubric defined the lack of any pitch jumps as a 1 (*no control*). The use of pitch changes, including a broader range and variety of pitches increases a speaker's rating on the scale up to a 5 (*complete control*). For variable c, the rubric was based on the comparison of the predetermined (by the Edwards and Strattman manual) placement of pitch jumps in the read passage to the actual placement of pitch jumps on syllables and words as produced by the speaker. A rating of 1 represented the speaker's complete disregard for placement of pitch jumps.
As the placement of pitch jumps on syllables and words more closely resembles those of a native speaker, the rating increases up to a 5 to represent a speaker's complete control of pitch placement.

The significant increase in variable c represents the participants' application of principles taught in the accent modification course. It is possible for participants to show improvement in their selection of where to place the pitch jump while at the same time not making significant improvement in their range or variety of pitch production. This result is consistent with the Edwards, Strattman, and Burda (1998) study that identified the placement of pitch jumps as a speech characteristic that many nonnative English speakers enter a course in accent modification with knowledge of and increase the use of through training. In that study, participants' performances in pitch jump placement increased to 94% accuracy. The current study showed an increase in ratings from *little control* to *some control*. This could be attributed to pre-existing knowledge of the rules for the placement of pitch jumps and additional training time.

The limited improvement in the variability of pitch (variable a) could be attributed to the increased control of loudness (variable b). Some nonnative English speakers use loudness instead of pitch for special emphasis on words and/or syllables. The number of speakers who demonstrated complete control of the use of loudness increased 63%. This does not automatically imply that these speakers are using pitch with complete control, but they might be using it in any perceptible form instead of loudness. The 5 of 8 speakers who improved their control of loudness also increased their use of pitch jump by an average of 2 rankings. The influence of a speaker's native language upon use of loudness and pitch is an additional factor to take into consideration which was not investigated by the current study.

A variety of speech characteristics that listeners perceive as distracting such as mispronunciations, inappropriate pauses, rate (either too fast or too slow), and rhythm were condensed into one variable (g). These have been the focus of investigation in other studies (Blau, 1992; Munro & Derwing, 2001) yet were not within the scope of the current study's focus on intonation. The use of the intonational method resulted in a decrease in the use of additional speech characteristics that hinder comprehensibility; 36% of speakers demonstrated improvement in this area.

Future Research

This study corroborates previous studies' evidence for the intonational method of pronunciation instruction (Anderson-Hsieh, Johanson, & Koehler, 1992; Derwing, Munro, & Wiebe, 1998; Derwing & Rossiter, 2003; Edwards, Strattman, Cuda, &

Anderson, 1991; Tajima, Port, & Dalby, 1997). This study should be replicated with changes in assessment tasks, a longer time period, and an increased number of speech samples.

Whereas other studies investigated the effects of read vs. spontaneous speech samples (Derwing, Munro, & Weibe, 1998; Derwing & Rossiter, 2003), the only assessment task used in this study was a reading sample. Although read and spontaneous speech samples may be equivalent for the analysis of prosody, it is not certain whether this is also true for the other speech characteristics. For comparisons to similar studies, assessments on related variables should be included. The only equivalent variable between this study and others was *comprehensibility*. The addition of spontaneous speech samples would open avenues for further research on varied dimensions of speech such as the cognitive aspects of language processing.

Spontaneous speech is the most difficult speaking situation in terms of carryover, therefore it is more representative than a reading task in terms of "real-life" speaking habits. For this reason, a greater time frame is recommended between pre- and posttest analysis. A second course of accent modification would provide an additional 16 weeks of practice of the strategies taught in class and facilitate carryover to daily speech.

Due to the nature of TESOL, class sizes optimum for instructional purposes are small, typically under 20 students, which in turn affects research involving TESOL. In order to increase the sample size, data could be taken over multiple semesters and a consistent set of tasks could be recorded in pre- and post assessments. A variety of socio-

economic backgrounds and languages would offer more opportunities to investigate the influence of occupation and education level. The effects of a native language upon the second language could be investigated across all variables.

Question 2: The Modified Method

In addition to demonstrating that the Edwards and Strattman intonational method of accent modification results in positive changes to speech, this study indicated that the modifications made to that method of instruction did not produce improved outcomes. This result could be interpreted as indicating that the implicit means of instruction and additional activities added to the traditional method were not effective. This result was unexpected based on the research discussed in the literature review related to the social and cognitive aspects of language learning (Derwing & Munro, 1997; Derwing & Rossiter, 2003; Munro & Derwing, 1995a; Pennington, 1994; Stevick, 1978) and a communicative learning environment (Fraser, 1999; Krashen, 1987; Morley, 1994; Paradis, 2002). Consequently, further examination of the design and procedures of this study is necessary to explain these results.

Archived Speech Samples

The first aspect of this study that may have influenced the results was the use of archived tapes for the control group. The control group was comprised of 15 speech samples available in the form of archived audio tapes accumulated over 10 years of accent modification courses taught in the traditional manner. A consent form included in every class questionnaire provided permission for use of these recordings for research purposes. The advantage of these tapes was the possibility to match participants between

the groups based on the previously discussed variables, however, the use of archived tapes limited the options available to the researcher in terms of the types of tasks available for assessment.

Due to reliance upon archived audio tapes for the control group speech samples, only the assessment tasks recorded on those tapes could be compared to the experimental group speech samples. The archived tapes contained the assessment tasks provided in the *Accent Modification Manual*: (a) 14 sentences, (b) two short paragraphs from *The Fox and The Grapes* and *The Lion and The Mouse* fables, and (c) sequenced pictures. Not all archived tapes contained pre- and post recordings for each task. Many contained the pre-instruction recordings for all tasks and only *The Fox and The Grapes* reading was used for pre- and post evaluation. This eliminated the option of comparing spontaneous speech samples as provided by the picture sequence story and the unrehearsed reading of *The Lion and The Mouse* fable.

Practice Effect

A second aspect related to the control group that may have influenced the results of this study involved a potential "practice effect" that may have contributed to the performance of the control group. The modification of the Edwards and Strattman method entailed the addition of new classroom assignments and reorganization of the manual. The traditional method requires practice of strategies (e.g., ligatures, blends, H-deletion) as they occur in *The Fox and The Grapes* passage. Thus, the entire passage was used for practice throughout the accent modification course. The experimental group was taught the same strategies as presented in the manual but did not practice them on *The Fox and The Grapes* passage. Therefore, the post recordings for the control group were

rehearsed and the post recordings for the experimental group were not. As previously mentioned, greater carryover of strategies taught in class is evident in rehearsed readings versus unrehearsed readings (Edwards & Strattman, 1997). The impact of this practice effect is seen most significantly in the posttest scores on the use of pitch jumps (variable a) and overall comprehensibility (variable h). The experimental group posttest scores decreased on both variables.

Although the experimental group did not make significant gains in the use of links as compared to the control group on variable e, the standard deviation of the experimental group lessened from 1.1 to 0.8. This result is comparable to the control group's reduction in standard deviation (from 1.2 to 0.8) and indicates that individuals within the group became more consistent in their use of linking. The fact that the experimental group's result was the product of non-rehearsed material, in a circumstance where carryover is more difficult to sustain, indicates some progress.

Similar conclusions as those from the use of links (variable e) may be drawn from the placement of pitch jumps (variable c). The experimental group did not perform significantly better than the control group on the placement of pitch jumps but the standard deviation did lesson from 1.1 to 0.7 (vs. control group SD = 1.0, 0.7), indicating more consistency with the group. An important consideration is the predetermined placement of the pitch jumps in the passage used for assessment. The fact that the experimental group became more consistent in their placement of pitch jumps on words and syllables as they occurred in the read passage indicates understanding of the concept of pitch placement based on meaning, rather than practice.

Future Research

This study provides a foundation from which to work, although several limitations exist. Future research should offer more effective control over threats to validity such as measurement restrictions (external validity) and the practice effect (internal validity). Additionally, experiment design should be taken into consideration.

A recognized weakness of this study was the discrepancy in assessment tasks. The use of taped speech samples proved to be a useful means of acquiring speech samples yet it does have its limitations. Future research should ensure equitable speech samples representative of the measurements being investigated in the study. They should be balanced by either spontaneous or read passages and either unrehearsed or rehearsed material to reduce the practice effect on performance measures.

The quasi-experimental design of this study was typical for the small sample size inherent to TESOL classrooms. The sample size for this study (30 total nonnative English speaking participants) is comparable to other studies investigating the effects of pronunciation instruction: 20 nonnative speakers (Munro, 1998), 24 nonnative speakers (Williams, 1992), 48 nonnative speakers (Derwing & Munro, 1997; Derwing, Munro, & Weibe, 1998; Derwing & Rossiter, 2003; Munro & Derwing, 2001). For additional statistical analyses, the number and variety of assessment tasks could be increased (200 items, Munro & Derwing, 2001; 320 stimulus items, Munro, 1998). Other possibilities to increase the size of the study include listener-perception studies (4 nonnative speakers, 142 English listeners, Gass & Varonis, 1984; 3 nonnative speakers, 224 English listeners, Anderson-Hsieh & Koehler, 1988), and studies that synthesize the results of a series of

research projects (74 participants, Eisenstein, 1986). At the other end of the spectrum, single-subject designs, such as discourse analysis (Tyler, 1992) or longitudinal designs may provide more in-depth analysis of language use.

Qualitative research. Another approach to researching language is qualitative research. A qualitative study would allow for more observational data, more in-depth investigation of the participants' internal reflections, and open the door to potentially significant chance observations that were not hypothesized. This research question took a cognitive approach to pronunciation teaching—an approach that is on the forefront of research in bilingual language processing and teaching. A qualitative study could provide insight into the psychological and social aspects of communication that are currently missing from quantitative studies. The additional activities in the modified method provided information that was not included as part of this study because it was not comparable to the data from the traditional method of instruction. Feedback from students in the modified method was provided in the form of written responses to homework assignments and video taped discussions that took place in class. Student responses provide examples of the modified method's emphasis on the cognitive aspects of language learning and communicative environments. These activities did not provide quantitative data but did produce information that was useful to the students and researcher in terms of the effectiveness of the assignments and areas for future research.

Additional activities. As mentioned in the Methods chapter, new activities were added to the course to provide alternative means of instruction and additional practice of the principles and strategies taught in class. These included (a) prediction of pitch jumps in a television program; (b) use of gestures and body language; (c) speeches and

discussions; (d) voice mail; (e) observations and interaction assignments. The goal of these activities (as well as the reorganization of the chapter presentation and use of implicit teaching methods) was to facilitate language processing by minimizing metalinguistic demands (e.g., explicit details of ligatures and blends) within a communicative learning environment. Feedback from students helped decide if that environment had been achieved, "I really looked forward to coming to this class. I was more comfortable than any other class." The activities focused the students' attention on aspects of communication that were always present in the daily environment but because students had not previously attended to them and perceived them as relevant, they did not learn from them. As one student commented, "I pay attention to how people say things/words."

In the case of pitch jumps, an understanding of the meaningfulness of pitch jumps involves thinking about communicating in a new way, through the use of American English intonation. One student described how his observations continue to add to his learning experiences, "You never realize when you're talking to Americans how you seem to them, gestures, you can extract to your own speech." One measure of successful communication is the clear delivery of the message, as one student observed about changes to his own speech, "Since I have used the pitch, the less people ask me 'What did you say?' or 'Sorry?'"

These classroom activities created the opportunity for meaningful use and practice of these new communication skills and encouraged the extension of these skills into daily situations by increasing the speaker's ability to monitor and repair his own speech. Some students offered examples of where they practiced their new skills: "I try these things in

regular conversations with strangers or friends." "I practice at work, on the phone." "I use them at work and here at the university." "When I shop, I try to talk to the sales people more." "I try these things while teaching lab sessions and recently I have tried when giving a seminar presentation."

The confidence that results from preparation for communication breakdowns translates into the pursuit of increased and varied communication opportunities. One student conveyed his surprise at his success when speaking in an anxiety-provoking situation, "I never raise my voice or ask questions in front of many people like in the big meeting or in class. But this time I raised my voice in training class. I feel kind of weird but all people react normal to me, more than I expected. That is a good experience and I will not be shy to ask questions in front of many people anymore."

These statements reflect the students' experiences with improved overall communication skills. Although many mentioned the use of *pitch* as a strategy they continue to practice control over, not one student listed *linking*, *H-deletion*, or any segmental feature as relevant to their success in being understood. In the typical mode of quantitative research, these personal experiences with communication successes (or breakdowns) are not represented. A quantitative study is a snapshot of a person's speech in one context and does not represent the deeper social, emotional, and psychological issues the effects of changing one's speech can have oneself and others. Some students' comments tapped into these issues: "My Indian friends didn't like the way I speak, they say I am aping the Americans. My American friends were comfortable with that." "Non-native English speakers (my friends) have thought I am saying something wrong because I sound different than what I did before." These students provide examples of what

Stevick (1977) emphasized as critical areas of language learning—psychological and social aspects that are missing from pronunciation training techniques focused on linguistics. Linguistic-based teaching fits into an assessment mold that many teachers are familiar and comfortable with. Currently, there is a lack of assessment options for second-language pronunciation—pre- and post tests do not adequately represent the speaker's conceptual knowledge and student self-assessments are uncalibrated. Future studies should combine including holistic, qualitative assessments of communication alongside quantitative analysis.

Conclusion

The findings of this study suggest that an intonational method of accent modification is an effective means of improving speech characteristics that increase nonnative English speakers' comprehensibility. The Edwards and Strattman method incorporates minimal instruction on segmental features and relies heavily upon the use of prosodic features. This method uses teaching strategies that explicitly state the rules and processes involved in aspects of co-articulation and special emphasis. In comparison to a modified version of that method that uses implicit teaching strategies, the Edwards and Strattman method was found to produce more significant improvements in overall comprehensibility. Research design, use of archived speech samples, and assessment techniques may have been contributing factors to this outcome and form the basis of future research considerations.

REFERENCES

Alexander, F. M., (1932). *The use of the self*. Los Angeles, CA: Centerline Press.

American Speech-Language-Hearing Association. (2001, April). *Scope of practice in speech-language pathology*. Retrieved April 27, 2005, from https://www.asha.org/about/ethics/

Anderson, J. R. (2000). *Learning and memory: An integrated approach* (2nd ed.). New York: John Wiley & Sons, Inc.

Anderson-Hsieh, J., Johanson, R., & Koehler, K. (1992). The relationship between native speaker judgments of nonnative pronunciation and deviance in segmental, prosody and syllable structure. *Language Learning*, *42*(4), 529-556.

Anderson-Hsieh, J. & Koehler, K. (1988). The effect of foreign accent and speaking rate on native speaker comprehension. *Language Learning*, *38*(4), 561-613.

Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence & J. T. Spence (Eds.), *The psychology of learning and motivation: Advances in research and theory* (pp. 89-105). New York: Academic Press.

Baddeley, A. D. (2000). The episodic buffer: A new component of working memory? *Trends in Cognitive Sciences*, *4*(11), 417-423.

Baddeley, A. D., & Hitch, G. (1974). Working memory. In G. H. Bower (Ed.), *The psychology of learning and motivation: Advances in research and theory* (pp. 47-89). New York: Academic Press.

Bever, T. G., & Sanz, M. (1997). Empty categories access their antecedents during comprehension: Unaccusatives in Spanish. *Linguistic Inquiry*, 28, 8-91. In J. L. Nicole (Ed.), *One Mind, Two Languages*. Malden, MA: Blackwell Publishers.

Blau, E. K. (1992). The effect of syntax, speed, and pauses on listening comprehension. *TESOL Quarterly*, *26*(4). 746-747.

Bonate, P. L. (2000). *Analysis of pretest-posttest designs*. New York: Chapman & Hall/CRC.

Bowerman, M. (1985). What shapes children's grammars? In D. I. Slobin (Ed.), *The crosslinguistic study of language acquisition*. *Volume 2: Theoretical issues*. Hillsdale, NJ: Erlbaum.

Brown, A. (1992). *A survey of attitudes and teaching practices related to pronunciation teaching*. Perth: Adult Migrant English Services, Western Australia.

Bruner, J. S., Goodnow, J. J., & Austin, G. A. (1956). *A study of thinking*. New York: Wiley.

Celce-Murcia, M. (1987). Teaching pronunciation as communication. In J. Morley (Ed.), *Current perspectives on pronunciation*: *Practices anchored in theory*. Washington, DC: TESOL.

Celce-Murcia, M., Brinton, D. M., Goodwin, J. M. (1996). *Teaching pronunciation: A reference for teachers of English to speakers of other languages*. Cambridge, MA: Cambridge University Press.

Cheng, L. (1996). Beyond bilingualism: A quest for cross-cultural communicative competence. *Topics in Language Disorders*, *18*(4), 9-21.

Cheng, L. (1999). Moving beyond accent: Social and cultural realities of living with many tongues. *Topics in Language Disorders*, *19*(4), 1-10.

Chomsky, N. (1965). *Aspects of the theory of syntax*. Cambridge, MA.: MIT.

Clement, R., Baker, S. C., & MacIntyre, P. D. (2003). Willingness to communicate in a second language: The effects of context, norms, and vitality. *Journal of Language and Social Psychology*, *22*(2), 190-209.

Compton, A. J. (1983). *Phonological assessment of foreign accent*. San Francisco: Carousel House.

Cook, V. J. (2001). Requirements for a multilingual model of language production. Retrieved July 12, 2005, from http://homepage.ntlworld.com/vivian.c/Writings/Papers/RequirementsForMultilingualModel.htm

Cooper, F. S., Delattre, P. C., Liberman, A. M., Borst, J. M., & Gerstman, L. J. (1952). Some experiments on the perception of synthetic speech sounds. *Journal of the Acoustical Society of America*, *24*(6), 597-606.

Cramer, D. (1998). *Fundamental statistics for social research: Step-by-step calculations and computer techniques using SPSS for Windows*. New York: Routledge.

Cummins, J. (1999, January). *Beyond adversarial discourse: Looking for common ground in the education of bilingual students*. Keynote presentation, National Association of Bilingual Education. Denver, CO. In L. L. Cheng, Moving beyond accent: Social and cultural realities of living with many tongues. *Topics in Language Disorders*, *19*(4), 1-10.

Daneman, M. (1991). Working memory as a predictor of verbal fluency. *Journal of Psycholinguistic Research*, 20, 445-464.

Dato, D. (1986). *Psycholinguistic assessment program for English learners*. Rockville, MD: Bicomm Institute.

De Bot, K. (1992). A bilingual production model: Levelt's speaking model adapted. *Applied Linguistics*, 13, 1-24.

Dechert, H. W. & Raupach, M. (1987). *Psycholinguistic models of production*. Norwood, NJ: Ablex.

Derwing, T. M., & Munro, M. J. (1997). Accent, intelligibility and comprehensibility: Evidence from four L1s. *Studies in Second Language Acquisition*, 19, 1-16.

Derwing, T. M., & Rossiter, M. J. (2003). The effects of pronunciation instruction on the accuracy, fluency, and complexity of L2 accented speech. *Applied Language Learning*, *13*(1), 1-17.

Derwing, T. M., Munro, M. J, & Wiebe, G. (1998). Evidence in favor of a broad framework for pronunciation instruction. *Language Learning*, *48*(3), 393-410.

Dulay, D., Burt, M., Krashen, S. (1982). *Language two*. New York: Oxford University Press, Inc.

Edwards, H. T., & Strattman, K. H. (1994). *The role of phonetic and prosodic variables in accent modification*. Paper presented at the American Speech-Language-Hearing Association convention, New Orleans, LA.

Edwards, H. T., & Strattman, K. H. (1995). *Prosodic assessment in accent modification: Spontaneous speech or controlled reading?* Paper presented at the American Speech-Language-Hearing Association convention, Orlando, FL.

Edwards, H. T., & Strattman, K. H. (1996). *Accent modification manual*: *Materials and activities, instructor's text*. San Diego, CA: Singular Publishing Group, Inc.

Edwards, H. T., & Strattman, K. H. (1997). *Carryover in accent modification*: *Fact or Fantasy*. Paper presented at the American Speech-Language-Hearing Association convention, Boston, MA.

Edwards, H. T., Strattman, K. H., & Anderson, P. J. (1991). *"Linking" and pronunciation*: *A comparative study in accent reduction*. Paper presented at the American Speech-Language-Hearing Association convention, Atlanta, GA.

Edwards, H. T., Strattman, K. H., & Burda, A. (1998). *Meta-knowledge of accent modification before and after training*. Paper presented at the American Speech-Language-Hearing Association convention, San Antonio, TX.

Edwards, H. T., Strattman, K. H., Cuda, R. A., & Anderson, P. J. (1990). *A comparison of intonation and pronunciation training in accent modification*. Paper presented at the American Speech-Language-Hearing Association convention, Seattle, WA.

Eisenstein, M. R. (1986). Target language variation and second-language acquisition: Learning English in New York City. *World Englishes*, *5*(1), 31-46.

Ellis, H. C., & Ashbrook, P. W. (1988). Resource allocation model of the effects of depressed mood states on memory. In K. Fiedler & J. Forgas (Eds.), *Affect, cognition and social behavior*. Toronto: Hogrefe.

Engle, R. W., Cantor, J., & Carullo, J. J. (1992). Individual differences in working memory and comprehension: A test of four hypotheses. *Journal of Experimental Psychology*: *Learning, Memory, and Cognition*, 18, 972-992.

Engle, R. W., Conway, A. R. W., Tuholski, S. W., & Shisler, R. J. (1995). A resource account of inhibition. *Psychological Science*, 6, 122-125.

Eysenck, M. W. (1983). Anxiety and individual differences. In G. R. J. Hockey (Ed.), *Stress and fatigue in human performance*. Chichester: John Wiley & Sons.

Faerch, C. & Kasper, G. (1983). Plans and strategies in foreign language communication. In C. Faerch & G. Kasper (Eds.), *Strategies in interlanguage communication* (pp. 20-60). London: Longman.

Fairbanks, G. (1960). *Voice and articulation drillbook*. New York: Harper.

Feldenkrais, M. (1972). *Awareness through movement*: *Health exercises for personal growth*. New York: Harper & Row.

Flege, J. E., & Fletcher, K. L. (1995). Talker and listener effects on degree of perceived foreign accent. *Journal of Acoustical Society of America*, 91, 370-389.

Flege, J. E., Munro, M. J., & MacKay, I. R. A. (1995). Factors affecting strength of perceived foreign accent in second language. *Journal of Acoustical Society of America*, 97, 3125-3134.

Flege, J. E., Takagi, N., & Mann, V. (1995). Japanese adults can learn to produce English /r/ and /l/ accurately. *Language and Speech*, 38, 25-56.

Flowerdew, J., & Tauroza, S. (1995). The effect of discourse markers on second language lecture comprehension. *Studies in Second Language Acquisition*, *17*(4), 435-458.

Fortkamp, M. B. M. (1999). Working memory capacity and L2 speech production. Retrieved March 5, 2003, from ERIC Document Reproduction Service Web site: http://www.edrs.com [ED437834]

Fraser, H. (1999). ESL pronunciation teaching: Could it be more effective? *Australian Language Matters*, *7*(4), 7-8.

Fraser, H. (2000). *Coordinating improvements in pronunciation teaching for adult learners of English as a second language* (Gov. Rep.). Armidale, New South Wales, Australia: University of New England, Linguistics. Canberra: DETYA (ANTA Innovative Project).

Gass, S. & Varonis, E. M. (1984). The effect of familiarity on the comprehensibility of non-native speech. *Language Learning*, 34, 65-89.

Gilbert, J. (2001). *Clear speech from the start: Basic pronunciation and listening comprehension in North American English*: *Student's book*. New York: Cambridge University Press.

Goodwin, J., Brinton, D., & Celce-Murcia, M. (1994). Pronunciation assessment in the ESL/EFL curriculum. In J. Morley (Ed.), *Pronunciation pedagogy and theory*. Alexandria, VA: TESOL.

Green, D.W. (1998). Mental control of the bilingual lexico-semantic system. *Bilingualism*: *Language and Cognition*, 1, 67-81.

Grosjean, F. (2001). The bilingual's language modes. In J. Nicol (Ed.), *One mind, two languages*: *Bilingual language processing* (pp. 1-22). Oxford: Blackwell.

Hahne, A. (2001). What's different in second-language processing? Evidence from event-related brain potentials. *Journal of Psycholinguistic Research*, 30, 251-266.

Hunt, R. R., & Ellis, H. C. (2004). *Fundamentals of cognitive psychology* (7th Ed.). New York: McGraw-Hill.

Kandel, E. R., & Hawkins, R. D. (1992). The biological basis of learning and individuality. *Scientific American*, September, 79-86.

Kay Elemetrics Corporation. (1998). Visi-Pitch II, Model 3300. Lincoln Park: New Jersey.

Kelly, G. A. (1955). *The psychology of personal constructs*. New York: Norton.

Kendler, H. H. (1987). Cognitive psychology. In H. Kendler (Ed.), *Historical foundations of modern psychology*, (pp. 6-14). Pacific Grove, CA: Dorsey Press, Brooks/Cole Publishing Co.

Kenworthy, J. (1987). *Teaching English pronunciation*. New York: Longman.

Klein, S. B., & Loftus, J. (1988). The nature of self-referent encoding: The contributions of elaborative and organizational processes. *Journal of Personality and Social Psychology*, 55, 5-11.

Krashen, S. (1982). *Principles and practice in second language acquisition*. New York: Pergamon. New York: Pergamon.

Krashen, S. (1987). *Principles and practice in second language acquisition*. New York: Pergamon.

Krashen, S., (1999, January). *English plus heritage language development*. Keynote presentation at the National Association of Bilingual Education 28th Annual International Bilingual/Multicultural Education Conference. Denver, CO.

Krashen, S., & Terrell, T. (1983). *The natural approach*: *Language acquisition in the classroom*. Oxford: Pergamon.

Kroll, J. F. & De Groot, A. M. B. (1997). Lexical and conceptual memory in the bilingual: Mapping from to meaning in two languages. In A. M. B. De Groot and J. F. Kroll (Eds.), *Tutorials in bilingualism*: *Psycholinguistic perspectives* (pp. 169-199). New Jersey: Lawrence Erlbaum Associates.

Langdon, H. W. (1999). Foreign accent: Implications for delivery of speech and language services. *Topics in Language Disorders*, *19*(4), 49-65.

Lehiste, I. (Ed.). (1967). *Readings in acoustic phonetics*. Cambridge: MIT Press.

Lenneberg, E. (1967). *Biological foundations of language*. New York: John Wiley.

Lessac, A., (1967). *The use and training of the human voice* (2nd ed.). New York: DBS Pub.

Levelt, W. J. M. (1989). *Speaking*: *From intention to articulation*. Cambridge, MA: MIT Press.

Matsuura, H., Chiba, R., & Fujieda, M. (1999). Intelligibility and comprehensibility of American Irish Englishes in Japan. *World Englishes*, *18*(1), 49-62.

Miller, G. A. (1956). The magical number seven plus or minus two: Some limits on our capacity for processing information. *Psychological Review*, 63, 81-97.

Montgomery, J. K. (1999). Accents and dialects: Creating a national professional statement. *Topics in Language Disorders*, *19*(4), 78-86.

Morley, J. (Ed.). (1987). *Current perspectives on pronunciation*: *Practices anchored in theory*. Alexandria, VA: TESOL.

Morley, J. (1994). A multidimensional curriculum design for speech-pronunciation instruction. In J. Morley (Ed.), *Pronunciation pedagogy and theory*: *New views, new directions* (pp. 66-91). Alexandria, VA: TESOL.

Morley, J. (1996). Second language speech/pronunciation: Acquisition, instructions, standards, variation, and accent. In H. W. Langdon, (1999). Foreign accent: Implications for delivery of speech and language services, *Topics in Language Disorders*, *19*(4), 49-65.

Mowrer, R., & Klein, S. B. (1989). A contrast between traditional and contemporary learning theory. In S. B. Klein & R. R. Mowrer (Eds.), *Contemporary Learning Theories* (pp. 1-10). New Jersey: Erlbaum.

Munro, M. J. (1998). The effects of noise on the intelligibility of foreign-accented speech. *Studies in Second Language Acquisition*, *20*(2), 139-154.

Munro, M. J., & Derwing, T. M. (1995a). Foreign accent, comprehensibility and intelligibility in the speech of second language learners. *Language and Learning*, 45, 73-97.

Munro, M. J., & Derwing, T. M. (1995b). Processing time, accent and comprehensibility in the perception of native and foreign accented speech. *Language and Speech*, 38, 289-306.

Munro, M. J., & Derwing, T. M. (2001). Modeling perceptions of the accentedness and comprehensibility of L2 speech: The role of speaking rate. *Studies in Second Language Acquisition*, *23*(4), 451-68.

Munro, M. J., Flege, J. E.., & MacKay, I. R. A. (1996). The effects of age of second language learning on the production of English vowels. *Applied Psycholinguistics*, 17, 313-334.

Neimeyer, R. A. (1999). Constructivist psychotherapies: Features, foundations, and future directions. In R. A. Neimeyer & M. J. Mahoney (Eds.) *Constructivism in Psychotherapy* (pp. 11-38). Washington, DC: American Psychological Association.

Nelson, C. (1982). Intelligibility and non-native varieties of English. *English Across Cultures*, 15, 57-73.

Paradis, M. (1993). Linguistic, psycholinguistic, and neurolinguistic aspects of "interference" in bilingual speakers: The activation threshold hypothesis. *International Journal of Psycholinguistics*, 9, 133-145.

Paradis, M. (2000). Cerebral representation of bilingual concepts. *Bilingualism*: *Language & Cognition*, 3, 22-24.

Paradis, M. (2002, May). Neurolinguistics of bilingualism and the teachings of languages. In P. Bouissac (Chair), *The multimodality of human communication*: *Theories, problems, and applications*. Symposium conducted at the University of Toronto, Victoria College, Canada.

Parish, C. (1977). A practical philosophy of pronunciation. *TESOL Quarterly*, *11*(3), 311-17.

Pennington, M. C. (1994). Recent research in L2 phonology: Implications for practice. In J. Morley (Ed.), *Pronunciation pedagogy and theory*: *New views, new directions* (pp. 92-108). Alexandria, VA: TESOL.

Rescorla, R. A. (1988). Pavolvian conditioning: It's not what you think it is. *American Psychologist*, *43*(3), 151-160.

Roelofs, A. (1998). Lemma selection without inhibition of languages in bilingual speakers. *Bilingualism*: *Language and Cognition*, 1, 94-95.

Schmidt, A. M., & Sullivan, S. (2003). Clinical training in foreign accent modification: A national survey. *Contemporary Issues in Communication Science and Disorders*, 30, 127-135.

Shaw, G. B. (1916). *Pygmalion*. New York: Brentano.

Shehadeh, A. (1999). Non-native speakers' production of modified comprehensible output and second language learning. *Language Learning*, *49*(4), 627-75.

Sikorski, L. (1988a). *Mastering the intonation patterns of American English*. Santa Ana, CA: LDS and Associates.

Sikorski, L. (1988b). *Mastering effective English*: *Workbooks and tapes for accented speech*. San Antonio, TX: Harcourt Brace and Co.

Slobin, D. I. (1971). *Psycholinguistics*. Glenview, IL: Scott, Foresman, & Company.

Stern, D. A. (1987). *The sound and style of American English*: *A course in foreign accent reduction*. Los Angeles, CA: American Dialect Specialists, Inc.

Stern, D. A. (1995). *Techniques for teaching accent reduction*; *a non-traditional aproach for*: *ESL teachers, speech pathologists, drama instructors*. Lyndonville, VT: Dialect Accent Specialists, Inc.

Stevick, E. W. (1978). Toward a practical philosophy of pronunciation: Another view. *TESOL Quarterly*, *12*(2), 145-50.

Stockman, I. J., Boult, J., & Robinson, G. (2004). Multicultural issues in academic and clinical education. *The ASHA Leader*, *9*(13), 6, 20-22

Swain, M., & Lapkin, S. (1995). Problems in output and the cognitive processes they generate: A step towards second language learning. *Applied Linguistics, 16*(3), 371-391.

Swan, M., & Smith, B. (2001). *Learner English*. Cambridge, UK: Cambridge University Press.

Tajima, K., Port, R., & Dalby, J. (1997). Effects of temporal correction on intelligibility of foreign-accented English. *Journal of Phonetics*, 25, 1-24.

Teachers of English to Speakers of Other Languages. (2005). *TESOL's mission, values, and vision*. Retrieved from http://www.tesol.org/s_tesol/sec_document.asp?CID=3&DID=220

Teran, R., & Edwards, H. T. (1979). Reduction of foreign accent through melodic intonation. *The Journal of the Kansas Speech and Hearing Association*, *19*(2), 1-11.

Test of English as a Foreign Language. (2004). Princeton, NJ: Educational Testing Services. (http://www.ets.org/).

Tiffen, B. (1992). A study of the intelligibility of Nigerian English. In A. van Essen & E. I. Burkart (Eds.), *Homage to W. R. Lee*: *Essays in English as a foreign or second language* (pp. 255-259). Berlin: Foris.

Toosi, N. (2003, August 10). Free speech: Experts help foreign-born professionals shed unclear accents. *JSOnline*. Retrieved July 1, 2005, from http://www.jsonline.com/news/metro/aug03/161421.asp

Tyler, A. (1992). Discourse structure and the perception of incoherence in international teaching assistants' spoken discourse. *TESOL Quarterly*, *26*(4), 713-729.

VASTA (2005). *VASTA History*. Retrieved July 11, 2005, from http://www.vasta.org/history.html

Wardhaugh, R. (2002). *An introduction to sociolinguistics*. Oxford, UK: Blackwell Publishing.

Williams, J. (1992). Planning, discourse marking, and the comprehensibility of international teaching assistants. *TESOL Quarterly*, *26*(4), 693-711.

Wolfram, W., & Fasold, R. W. (1974). *The study of social dialects in American English*. Englewood Cliffs, NJ: Prentice-Hall. (as cited in American Speech-Language-Hearing Association Joint Subcommittee of the Executive Board on English Language Proficiency. (1998). *Students and professionals who speak English with accents and nonstandard dialects: Issues and recommendations*. Position statement and technical report. *Asha*, 40 (Suppl. 18), 28-31).

Wolgemuth, J. C. (1994). *Accent modification and pronunciation teaching*. Unpublished master's thesis, Wichita State University, Wichita.

Wong, R. (1987). Learner variables and prepronunciation considerations in teaching pronunciation. In J. Morley (Ed.), *Current perspectives on pronunciation*: *Practices anchored in theory*. Washington, DC: TESOL.

Yule, G. & Macdonald, D. (1994). The effects of pronunciation teaching. In J. Morley (Ed.), *Pronunciation pedagogy and theory*. Alexandria, VA: TESOL.

APPENDIXES

APPENDIX A

STUDENT QUESTIONNAIRE

Name_____ Age_____ Sex M F

Major (if in school) _____ Home Phone _____ E-Mail _____

Future/Present Career _____

Current Employment _____

TOEFL or other ESL Test Score _____

Name of test if different from TOEFL _____

What country do you come from? _____

What is your first (or native) language? _____

Dialect, if different _____

What other languages do you speak? _____

If you speak another variety of English, which? _____

Did you study American English before coming to this country? Yes ☐ No ☐

How were you taught English (check all that apply):

_____ reading/writing/listening

_____ grammar/vocabulary/translation

_____ self-study

_____ by radio/TV

_____ in English class

_____ ESL class

_____ intensive language school

_____ by native English teachers

_____ by nonnative English teachers

_____ in elementary school

_____ in high school

_____ in college

_____ by talking to English speakers

_____ by family members

_____ Other: _____

APPENDIX A (continued)

How many years have you **studied** English? _____

How many years have you **spoken** English? _____

How many hours on an average day do you speak your native language? _____

How many hours on an average day do you speak English? _____

As a child, did you have any problems learning or speaking your native language? Yes ☐ No ☐

If Yes, please explain: _____

Do you have any hearing difficulties? Yes ☐ No ☐

If Yes, please explain: _____

Speaking Opportunities (In English)
Here is a list of speaking situations. Tell how frequently you participate in each activity by using these numbers: 1 = Never 2 = Rarely 3 = Sometimes 4 = Everyday

Then tell the difficulty each situation gives you by using these numbers:
0 = Not Applicable 1 = No Difficulty 2 = Some Difficulty 3 = Great Difficulty

Situation	Frequency	Difficulty
Conversation with friends	_____	_____
Asking questions	_____	_____
Responding to questions	_____	_____
Presenting a prepared speech or report	_____	_____
Tutoring or small group discussion	_____	_____
Talking on the telephone	_____	_____
Classroom teaching	_____	_____
Presenting plans/proposals in business Meetings	_____	_____

APPENDIX A (continued)

Listening Opportunities (In English)
Here is a list of listening situations. Tell how frequently you participate in each activity by using these numbers: 1 = Never 2 = Rarely 3 = Sometimes 4 = Everyday

Then tell the difficulty each situation gives you by using these numbers:
0 = Not Applicable 1 = No Difficulty 2 = Some Difficulty 3 = Great Difficulty

Situation	Frequency	Difficulty
Radio, television	_____	_____
Lectures	_____	_____
Work/business meetings	_____	_____
Telephone talk	_____	_____
Conversations	_____	_____
Understanding questions	_____	_____

What other information will your teacher(s) need to know about you?

_____

_____

Note: During this course, your instructor will help you make several recordings of your speech. Please give your permission to use these recordings by checking "Yes" below. At no time will your name be used in any research related to the recordings. If you do not grant permission, check "No."

My recordings may be used to improve instruction in accent modification. Yes ☐ No ☐

Signature: _____ Date: _____

APPENDIX B

CONSENT FORM

You are invited to participate in a study of teaching methods for the purpose of accent modification. I hope to learn if additional instructional methods contribute to English communication skills for nonnative speakers of English. You were selected as a possible participant in this study because you are not a native speaker of English and are enrolled in the Communicative Disorders and Sciences (CDS) 570 course—Accent Modification.

If you decide to participate, you will be asked to make audio and video recordings in addition to those that are part of the typical curriculum for this course. These include video taped interviews with the instructor and class presentations, audio journals, and written journals. All additional recordings will take place within the allocated class time period (11:00-12:15, Tuesday and Thursday). Any recordings required beyond the scheduled class time will be scheduled at your convenience and should require no more than approximately 20 minutes of your time.

The results of this study will help instructors understand the effectiveness of a variety of teaching methods in the accent modification classroom. The information obtained in this study will be completely confidential. There will be no way to identify you by name. If you desire a copy of the results of this study, you may give me your name and mailing address, and I will send you the information upon completion of the study.

Participation in this study is entirely voluntary. Your decision whether or not to participate will not affect your future relations with Wichita State University. If you decide not to participate, you may withdraw from the study at any time without affecting your status as a student. Participation, or withdrawal from participation, will not affect your passing status as a student enrolled in the CDS 570 course.

If you have any questions about this research, please ask me. If you have any additional questions during this study, I will be happy to answer them. I can be contacted at Wichita State University, Box 75, Wichita, KS 67208; (316) 978-3240.

You will be offered a copy of this consent form to keep. You are making a decision whether or not to participate. Your signature indicates that you have read the information provided above and have voluntarily decided to participate.

_____ _____
Signature of Participant Date

_____ _____
Signature of Investigator Date

APPENDIX C

EXIT INTERVIEW QUESTIONS

1. What did you enjoy most in this class?

2. What would you add to the class?

3. What would you leave out of the class?

4. Were the observations helpful?

5. Were the interaction assignments helpful?

6. What will you remember the most from this class?

7. If accent modification II were offered, would you enroll?

APPENDIX D

RATING RUBRIC

Table 12

	Variable	1 No Control	2 Little Control	3 Some Control	4 Good Control	5 Complete Control
A	uses pitch jump	does not use pitch jumps; monotone; no range, no variety	uses some pitch jumps; narrow range	uses limited range; uses limited variety	uses native-like pitch range on some jumps; good range; little variety	uses native-like range and variety of pitch on all jumps
B	uses loudness instead of pitch	uses loudness to replace pitch jump				uses appropriate level of loudness in combination with pitch jump
C	uses appropriate syllable(s) / word(s) for pitch jump	does not choose appropriate syllable(s) / word(s)	chooses one or two appropriate syllable(s) / word(s)	makes a few expected choices, makes mostly inappropriate choices	chooses appropriate syllables/words plus a few unexpected choices	always chooses appropriate syllable(s) / word(s)
D	falls in pitch at ends of phrases	never falls in pitch at the ends of phrases; completely flat or always goes up at end	slight variation in pitch from a baseline pitch	falls some of the time; sometimes jumps up at ends; sometimes no fall at end	falls most of the time; occasional up or lack of fall at end	always falls in pitch at ends of phrases
E	links words together (ligatures and blends)	words do not blend together, may sound very choppy; very distracting	a few words blended together; sounds choppy; distracting	some words blended together but is not smooth; slightly distracting	most words blended together; not a distraction	words blend together, smooth transitions between words; native-like
F	uses inappropriate duration of vowels	rhythm does interfere with intelligibility; uses very non-native like rhythm				rhythm does not interfere with intelligibility; uses native-like rhythm
H	Overall perception of comprehensibility	listener can not understand speaker without extreme difficulty	listener can understand with some difficulty; accent interferes with intelligibility	listener can understand with some effort; accent is distracting	listener can understand without effort, accent is a minor distraction	listener can understand without effort, accent may be present but is not distracting

APPENDIX E

LISTENER-RATER FORM

1	2	3	4	5
no control	little control	some control	good control	complete control

Speech Sample # _____

Pitch:					
A. uses pitch jumps	1	2	3	4	5
B. uses loudness instead of pitch	1	_____			5
C. uses appropriate syllable(s) / word(s) for pitch jump	1	2	3	4	5
D. falls in pitch at ends of phrases	1	2	3	4	5
Rhythm:					
E. links words together (ligatures and blends)	1	2	3	4	5
F. uses inappropriate duration of vowels	1	_____			5
G. uses additional speech characteristics (mispronunciations, rate, inappropriate pauses)				yes___	no_____
Overall:					
H. Overall perception of comprehensibility	1	2	3	4	5

APPENDIX F

MEAN SCORES

Table 13

Speaker	Order on CD	1-Male 2-Female	Lang.	A Pre	B Pre	C Pre	D Pre	E Pre	F Pre	G Pre	H Pre
1C	53	2	1	3	5	3	4	2	1	1	2
2C	13	1	1	1	1	2	2	1	1	1	1
3C	58	1	1	3	5	2	3	1	1	1	2
4C	23	2	2	5	5	3	4	2	5	2	4
5C	22	1	2	3	1	2	3	3	1	1	3
6C	44	2	3	4	5	4	4	3	5	1	3
7C	54	2	4	4	5	3	4	1	5	1	3
8C	20	2	4	4	5	3	4	2	5	1	1
9C	1	1	4	2	1	3	2	3	5	1	3
10C	52	1	5	3	1	3	3	3	5	1	3
11C	2	2	5	4	5	4	2	5	5	1	5
12C	10	1	5	2	1	1	2	1	1	1	2
13C	51	2	5	4	5	4	4	4	5	2	4
14C	57	1	6	1	1	1	1	1	1	1	1
15C	36	2	6	3	5	3	3	2	5	1	3
1E	24	2	1	4	5	3	3	2	5	1	4
2E	59	1	1	3	5	3	3	2	5	2	3
3E	56	1	1	1	1	1	1	1	1	1	1
4E	37	2	2	4	5	4	5	2	5	2	4
5E	60	1	2	2	5	3	3	1	1	1	3
6E	48	2	3	3	5	3	3	2	1	1	2
7E	45	2	4	5	5	4	5	4	5	2	5
8E	3	2	4	5	5	4	4	4	5	1	4
9E	15	1	4	3	1	3	5	2	5	1	3
10E	31	1	5	2	5	2	3	2	1	1	2
11E	5	2	5	4	5	4	4	3	5	1	4
12E	49	1	5	4	5	4	4	4	5	1	4
13E	55	2	5	3	5	2	3	3	5	1	4
14E	27	1	6	2	5	2	2	1	1	1	1
15E	46	2	6	1	5	1	1	1	1	1	1

Languages:
1. Chinese
2. Japanese
3. Korean
4. Spanish
5. South Asian
6. Vietnamese

APPENDIX F (continued)

MEAN SCORES

Table 13 (continued)

Speaker	Order on CD	1-Male 2-Female	Lang.	A Post	B Post	C Post	D Post	E Post	F Post	G Post
1C	53	2	1	4	5	5	5	3	5	1
2C	13	1	1	3	5	4	4	3	5	1
3C	58	1	1	2	5	3	4	1	5	1
4C	23	2	2	3	5	5	4	4	5	2
5C	22	1	2	5	5	4	5	4	5	2
6C	44	2	3	4	5	4	5	4	5	2
7C	54	2	4	4	5	4	5	4	5	2
8C	20	2	4	3	5	2	3	1	5	1
9C	1	1	4	2	5	3	2	3	5	2
10C	52	1	5	4	5	4	5	5	5	2
11C	2	2	5	5	5	5	5	5	5	2
12C	10	1	5	5	5	4	5	4	5	2
13C	51	2	5	5	5	5	5	4	5	2
14C	57	1	6	3	5	3	3	2	1	1
15C	36	2	6	3	5	4	3	2	5	1
1E	24	2	1	2	5	4	4	3	5	1
2E	59	1	1	2	1	2	2	1	5	1
3E	56	1	1	1	1	1	3	1	1	1
4E	37	2	2	3	5	4	4	2	5	1
5E	60	1	2	3	5	3	4	2	5	1
6E	48	2	3	2	5	3	4	2	5	1
7E	45	2	4	5	5	4	5	4	5	2
8E	3	2	4	4	5	4	5	4	5	2
9E	15	1	4	2	5	3	5	2	5	1
10E	31	1	5	2	5	2	4	1	1	1
11E	5	2	5	5	5	4	5	4	5	2
12E	49	1	5	3	5	4	2	4	5	2
13E	55	2	5	3	5	4	4	3	5	2
14E	27	1	6	2	5	1	2	1	1	1
15E	46	2	6	1	1	1	1	1	1	1

Languages:
1. Chinese
2. Japanese
3. Korean
4. Spanish
5. South Asian
6. Vietnamese